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# Are Female Top Managers Really Paid Less?

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**Abstract:** While we find no pay gap for the figure-head (CEO), there is significant pay discrimination for other female top managers who are board members as they earn £1.3 million less over a five-year period. We also show that the gender pay gap is lower for executives in firms with female non-executives. Female executives in 'male' industries face a smaller pay gap. The advice of top remuneration consultants does not reduce the pay gap for executive directors (excluding the CEO). We also find that the pay gap increases when accounting for marriage and parenthood.

**Keywords:** executive compensation, gender pay gap, gender discrimination, pay-for-performance, glass ceiling, children and female career.

**JEL codes:** J31, J33, M52, G30.

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# Are Female Top Managers Really Paid Less?

*"There is evidence that even when women do reach the highest levels of corporate management, they do not receive the same pay as men for the same job; a figure of 75% is often quoted. And rather than getting better over time, the position seems to be deteriorating."* (Economist: "The glass ceiling", 24/08/2011)

'*But the biggest obstacle (at least in most rich countries) is children. However organized you are, it is hard to combine family responsibilities with the ultra-long working hours and the "anytime, anywhere" culture of senior corporate jobs.*' (The Economist, 27th October, 2012)

## 1 Introduction

Female participation in the British labor market has been promoted for a long time and with remarkable success: 70.5% of women aged 15 to 64 years participate in the labor market (OECD Labour Force Statistics, 2010). Still, Eurostat (2011) reports an unadjusted gender pay gap in the UK of about 20% – in other words, female employees earn on average 20% less than male employees. The relative differences in remuneration even seem to be deteriorating: the global gender gap index released by the World Economic Forum in 2013 shows that the UK is only ranked number 18 out of 134 countries – down from the 9th position in 2006.

A recent report issued by the Chartered Management Institute (CMI, 2011) states that although gender wage equality has been achieved for junior executives, this is not the case for female managers in top corporate jobs. The literature advances several explanations for the gender wage gap. Booth, Francesconi, and Frank (2003) propose that 'sticky floors' are responsible: promotion rates for both women and men are equally fair, but women remain stuck at the lower end of the wage distribution due to a lack of convincing outside offers. Furthermore, there may be a 'glass ceiling' effect, i.e. the estimated gender wage gap increases the closer to the top of the pay

distribution (Arulampalam et al., 2005). Matsa and Miller (2011) propound 'networking-effects' as a possible cause, arguing that the proportion of females in top management is positively related to the percentage of female directors on the board (which is low). Other papers concentrate on the structure of remuneration contracts: Kulich et al. (2011) argue that the gender pay gap is driven by the fact that men have much stronger upward remuneration potential whereas women are offered contracts that are less performance sensitive and more suited for risk averse managers. Still, Joshi, Makepeace, and Dolton (2010), who focus on the differences in the gender pay gap by age group, state that women's better education starts to close the gap.

Our raw data in Figure 1 indicate that there is still a significant remuneration gap between male and female top managers (the executive directors) in the UK over our sample period (with exception of 2003): total compensation has risen substantially for both male and female executives over this period, and the size of the gender pay gap varies over time. The average base salary as well as the bonus of male executives has consistently been larger than that of female executives (Figure 2 and 3). Moreover, the mean level of incentive compensation awarded to male executives is significantly higher with exception of one single year (Figure 4).

[Insert Figures 1-4 about here]

While some papers provide explanations for the gender pay gap of top executives, methodological sound measurement of the (evolution of the) pay gap is scarce as the number of women who actually make it to the very corporate top is still rather modest. Past analyses often compare the average or median size of the pay of male and female executives and draw conclusions on the potential causes of gender-based discrimination at the top-corporate level. These studies are often flawed when they do not control for (i) *individual characteristics* such as position (CFO, CEO, executive chairman, etc.), tenure in that position, age; (ii) *firm characteristics* such as firm size and riskiness, firm leverage, growth and free cash flows, firm performance, internal governance structures comprising board size, board structure and independence, presence of female non-executive directors, and the use of board committees; (iii) contract composition (pay-for-performance sensitivity); (iv) ownership, in particular its

concentration and nature (type of major owners); and (v) the impact of remuneration consultants. In this light, one ought to be very careful in interpreting the above data presented in Figures 1-4 as evidence of the gender pay gap. Can we conclude from these numbers that female executive directors are discriminated? Not really, as comparing the average salary of males and females does not do justice to the impact of the individual situation of these managers such as the executive's position, her age and tenure in the job/corporation, education, track record, and the size and industry of her firm.

Moore (2004: 208) writes that "*Family responsibilities fall disproportionately on the women in top leadership positions. Marriage and parenthood impinge on women's careers to a far larger extent than they do on similarly situated men's.*" For this reason, we also study whether (the number of) children and marital status affects the pay gap. Bertrand, Golding and Katz (2010) examine the earnings of business school students after graduation and observe that the earnings of males and females diverge quickly – a result that the authors attribute to parenthood decisions. Interestingly, Angelov, Johansson, and Lindahl (2013) find that 15 years after entering parenthood, the male-female wage gap increases by 35 percentage points compared to its pre-child level. It should be noted that our study is not on the direct relation between parenthood and remuneration as we study this relation for those managers who had a successful career and made it to the top of the corporate ladder (they are members of the board of directors of listed companies). In other words, we study the gender pay gap for the 'survivors', most of whom have been able to combine parenthood with a successful career.

In this paper, we dispose of a particularly rich dataset covering both remuneration and career information of male and female top executives of virtually all companies listed in the UK over a pre-crisis sample (the period 1996 to 2007). We employ treatment effect estimations on our gamut of remuneration measures, which enables us to account for most of the unobserved heterogeneity from which many previous studies seem to suffer. After accounting for the most important observable characteristics at the manager, firm, and industry level, we compare the pay outcome of female and male directors supposing gender-based treatment ('discrimination').

We report the following findings. First, although our raw data report that the gender-based pay gap exists for CEOs and other top executives, our treatment effect analysis unveils little evidence of pay discrimination at the CEO level after controlling for firm size, industry, age, position, tenure and nearest-neighbor matching without replacement. The lack of a significant pay gap is confirmed by further analyses which in addition to the above variables further control for ownership concentration, internal corporate governance mechanisms, and performance and firm characteristics. Whereas there is no pay gap at the level of the figure-head of the firm – the CEO, there is strong pay discrimination at the level of the other top managers (the executive directors which include a.o. the deputy CEO, CFO etc.). These female executive directors earn on a yearly basis on average about £270k less than male directors in the same position, with similar tenure, in the same industry etc. The pay gap is visible at all components of pay: salary, bonus, and equity-based compensation. Second, whereas the remuneration of neither male nor female executives is performance-sensitive, that of CEOs is strongly performance-sensitive. The contracts of female CEOs are even more strongly related to both accounting and market-based performance than those of male CEOs. Third, we find that the pay-gap is lower for female executive directors when the firm has one or more female non-executive directors on the board. In such firms, female CEOs earn even more than their male colleagues with similar traits. Fourth, a female executive director employed in an industry with a high proportion of male managers receives an average total remuneration which is lower than that of male executives, but the gender pay gap is considerably smaller in 'male' industries such as financial services or ICT. In these industries, female CEOs even receive a higher total compensation than comparable male CEOs. Fifth, when the advice of a top-3 remuneration consultant is sought, the pay gap is small for CEOs but this is not the case for the other executive directors on the board. Finally, we study the impact of marital status and parenthood on the pay gap. Married female executive directors with children receive a higher remuneration than single female managers. Still, from a careful matching analysis, we learn that the pay gap between male and female executive directors widens when we account for parenthood and marriage, as married female executive directors with children earn much less than male executives with children (and single male managers).

The paper is organized as follows: the next section reviews the empirical evidence on the determinants of the gender wage gap. Section 3 expands on the regulation and lists the hypotheses, which are tested with methodologies laid out in Section 4. The results are presented in Section 5 and further discussed in Section 6.

## 2 The Empirical Evidence

The literature on gender-based discrimination comprises many explanations: glass ceilings, sticky floors, occupational and industrial segregation, tournament theory, and the glass cliff. In this section, we also touch upon behavioral biases such as the 'romance of leadership' theory and stereotyping.

### *2.1 Glass Ceilings and Sticky Floors*

Some studies relate the gender pay gap to promotion rates. For instance, Booth et al. (2003) state that the 'return-to-promotion' is higher for men: men's salaries are more frequently raised as a consequence of the fact that male managers more frequently seek and hence receive outside offers, and are more inclined to switch companies which increases the likelihood that such offers are credible. Accordingly, the fact that women do not receive as many pay rises is the fundamental idea behind the 'sticky-floors'-concept and the notion of higher opportunity cost for women. Smith, Smith, and Verner (2013) and Matsa and Miller (2011) argue that female managers are discriminated by male-dominated boards. They show that the hiring probabilities and promotion chances of women increase with the number of female (executive and non-executive) directors on the board.

### *2.2 Occupational and Industrial Segregation*

Jones and Makepeace (1996) argue that career success is predominantly related to work experience as there are few differences in pay for men and women with the same corporate rank, but considerable differences stemming from the allocation of men and women across ranks. Kidd and Goninon (2000) do not agree and demonstrate that there is a strong industry-effect in that both

male and female managers earn less for the same work in female-dominated industries than their counterparts in male-dominated industries. Bertrand and Hallock (2001) agree that about 80% of the observed differences in remuneration can be attributed to occupational segregation (controlling for size, age, and tenure). Allen and Sander (2002) discuss the idea of 'comparable worth': work predominantly done by women is valued less and is consequently rewarded less. The authors argue that women seem to accept this situation as they are less focused on their careers. Alkadry and Tower (2007: 889) confirm that "gender typing and socialization tend to result in the segregation of women in certain agencies, occupations, and positions." Thus, a considerable part of the differences in pay between male and female executives may be driven by the self-selection of women into certain occupations and industries.

### *2.3 Corporate Performance and the Glass Cliff*

Niederle and Vesterlund (2007) state that differences in pay result from different attitudes concerning intra-firm competition: men opt twice as much to engage in corporate tournaments than women. Whereas women seem to shy away from competition, men tend to embrace it, possibly due to overconfidence. In line with these results, Kulich et al. (2011) document that male managers' compensation packages are more performance-dependent than those of female managers. The stereotype that women are more risk averse than men may explain why women's pay is less performance-sensitive. A provocative idea is advanced by Ryan and Haslam (2005) in that female CEOs are appointed when the firm is experiencing poor performance or financial distress. Female CEOs are thus more likely to find themselves in an unenviable and possibly threatening situation after their appointment – the 'glass cliff'. Indeed, for the UK, Haslam, Ryan, Kulich, Trojanowski and Atkins (2009) fail to reject the 'glass cliff' hypothesis. Adams, Gupta and Leeth (2009) test the 'glass cliff' hypothesis for the US, but do not find support: female (male) managers are appointed as CEOs at times with relatively better (worse) financial health.

### *2.4 Behavioral Biases: Stereotyping and the Romance of Leadership View*

As company performance is directly attributed to the leader (Meindl, Ehrlich, and Dukerich, 1985), why do we observe so few women in a leadership position? In their meta-

analysis, Eagly et al. (1992) write that female leaders are typically more negatively perceived than male leaders. Schein (2001) explains that leadership is typically associated with masculine traits, such as competence and the ability to influence. Consequently, female leaders face prejudices concerning their supposedly lower ability to lead (Eagly and Karau, 2002). In sum, it might be due to this 'romance of leadership' that the shareholders' reaction to the announcement of the appointment of a female CEO is significantly more negative than that of a male CEO (Lee and James, 2007). This 'romance of leadership' bias affects the allocation of pay: Kulich, Ryan, and Haslam (2007) show that CEO pay is strongly performance-dependent for male executives, but not so for female managers. Moreover, the allocation of a bonus to a female leader is not solely based on company performance, as it would be in the case of a male leader, but also on perceptions of charisma and leadership ability.

Are there any reasons to believe that there are differences in terms of performance, values, or risk attitudes between male and female leaders? Eagly et al. (1995) argue that in aggregate, male and female leaders were no more or less effective, although they acknowledge gender differences regarding (i) the definition of the leadership role in male or female terms, (ii) the type of organization, and (iii) the level of leadership. In brief, the authors argue that female executives are only then more effective when the leadership roles are defined in less masculine terms (which may be the case for example in educational organizations), but will do less well compared with men, otherwise. Recent results substantiate gender differences in firm performance: Adams and Ferreira (2009) provide evidence that a higher ratio of women on the board weakens firm performance – possibly due to overmonitoring. This could be attributed, according to Adams and Funk (2011), to the idea that male directors care more about achievement and power than female directors, even though female directors are less security- and tradition-oriented than is generally assumed.

In sum, both corporate performance and leadership seem to be more associated with masculine traits, while female leaders are often interpreted as not being congruent with their gender role. The concept called the 'romance of leadership' suggests that pay-for-performance of male leaders typically exceeds that of female leaders.

### *2.5 Children, Marital Status, Careers and Compensation*

Does parenthood affect remuneration? Budig and England (2001) find that the impact of parenthood depends on the number of children: each additional child is associated with a 2-7% reduction in women's wages, but the impact of the first child is usually more limited with a reduction of 2.1% (Loughran and Zissimopolus, 2009). Bertrand et al. (2010) agree as they observe that the impact of the first child tends to be modest and temporary for female MBA graduates with lower-earning spouses. Highly skilled women also postpone childbearing to reduce its impact on career and compensation (Wilde, Batchelder, and Ellwood, 2010).[1]

Lundberg and Rose (2000) state that it is not just parenthood that influences compensation, they find that parents and non-parents differ even before the first birth as both men and women with children earned about 9% less before the birth of the first child. Importantly, some studies find no relation between managerial compensation and children (Loughran and Zissimopolous, 2009, Wilde et al., 2010) or even a positive effect (for men) (Lundberg and Rose, 2000).

In general, there are various reasons as to why marriage should have a positive effect on the male's labor market outcome: Cohen and Haberfeld (1991) point to effects provided by the spouse (such as improved household decision making, emotional support, job-related motivation and advice), as well as to the changed perception of the husband (greater stability and responsibility). Other studies invert the causality: successful men (with higher remuneration) are able to find a better (more educated) marriage partner (Cohen and Haberfeld, 1991; Loughran and Zissimopoulos, 2009). As far as we know, there are no studies examining the role of a male spouse on career success of female managers.

[1] Likewise, Wood et al. (1993) argue that women in anticipation of childcare acquire less job-related human capital than men. Lundberg and Rose (2000) state it is not childbearing that reduces productivity, but lower-productivity women selecting themselves into childbearing.

## 3 Wage Equality Regulations and Hypotheses

The foundation of 'equal pay for equal work' in the UK was established in article 119 of the Treaty of Rome in 1957. In 1970, the UK introduced the Equal Pay Act to prevent discrimination, which was followed by the Sex Discrimination Act (1975) to promote equal opportunities for both sexes. Maternity rights (of at least 26 weeks) were enshrined in the Employment Rights Act of 1996. The Kingsmill report (2001) on women's employment and pay summarizes the factors contributing to the gender wage gap as does the 'Just Pay' report issued by the Equal Pay Task Force in 2001: (i) discrimination in pay, (ii) occupational segregation, and (iii) the unequal impact of family responsibilities. The Employment Equality Regulations (2005) forbids discrimination on the grounds of pregnancy or maternal leave, and issues rules on (sexual) harassment. According to the Women and Work Commission (2006), women seem to be pushed into low-paying occupations and do not make full use of their skills. The Commission estimates that removing the barriers to women working in occupations traditionally taken by men and increasing women's participation in the labor market, could increase GDP by about 1.3 to 2.0%.

As the gender-related income inequalities may extend to the top management, we hypothesize that *female executive directors are paid on average less than men (H1a), and that the gender pay gap is higher in industries with a high concentration of male managers (H1b).*

Men opt twice as frequently to engage in a corporate tournament than women – a tendency that is largely attributed to overconfidence on the part of men (Niederle and Vesterlund, 2007). As a possible consequence, managerial compensation of male executives is more performance-sensitive than that of their female peers (Kulich et al., 2011). This study provides evidence that the allocation of a bonus to a female leader is not solely based on company performance, as it would be in the case of a male leader, but also on perceptions of charisma and leadership skills. Consequently, we hypothesize that *the composition of the compensation contracts of male executive directors is more incentives-based (higher bonus and more equity-based pay) than that of female executives (H2a), and that the pay-for-performance sensitivity is lower for female managers than for male managers (H2b).*

The percentage of female executive directors on the board is related to the number of women working in corporate top-jobs, possibly due to 'networking-effects' (Matsa and Miller, 2011). Likewise, Smith et al. (2013) observe that the hiring probabilities of women increase with a higher number of female directors on the board. While Selody (2011) suggests that boards may have biased beliefs about the competence of women, an increased number of women on the board may help to correct this view. Hence, we hypothesize that *companies with a higher percentage of female directors on the board will pay female executives more than firms without female board members (H3)*. It should be noted that this hypothesis is not formulated in terms of a causal relation between female (non-)executive directors and pay whereby those female directors are augmenting the pay for their female colleagues as it may be that it is simply part of the corporate culture to care about equal pay.

With gender-discrimination moving more and more into the public eye, remuneration contract design by remuneration consultants is expected to reduce the gender-based pay gap. Indeed, negative publicity induced by gender pay discrimination may tarnish consultants' reputation (Thomas, 2004). This may particularly hold true for the largest pay consultants that are subject to intense competition and the immediate threat of losing market share (Kabir and Minhat, 2011; Renneboog and Zhao, 2011). Consequently, we hypothesize that *hiring top remuneration consultants contributes to a reduction of the pay gap (H4)*.

Governance may also affect executive pay (Wade et al., 1997): a larger board and a higher proportion of non-executive directors may, due to the increased variety of opinions, contribute to more balanced decision-making and therefore offset some of the behavioral biases discussed above. Consequently, groundless differences in pay between men and women decrease in better-governed companies, as measured by the proportion of non-executive directors on the board, the presence of nomination-, remuneration-, and audit committees, as well as by the absence of CEO duality. Consequently, we conjecture that the pay gap is smaller in firms with better internal (board structure) corporate governance mechanisms. Previous research suggests that the compensation committee typically considers the specific tasks, seniority and experience, as well as the salary awarded at other firms in the same industry when determining a manager's salary

(Geiler and Renneboog, 2011). Therefore, we conjecture that pay increases in position, age, as well as tenure, and depends on industry, for which we control in the analyses below. Concerning firm characteristics, past studies show that pay typically strongly increases with firm size and growth in sales (Murphy, 1985, Jensen and Murphy, 1990) and performance (Kaplan, 1994). Therefore, we conjecture that pay increases in firm size (here also proxied by index membership - FTSE100, FTSE250, FTSE Small Cap), sales growth, return on assets (ROA), Tobin's Q, and free cash flow.

## 4 Sample Selection and Data Description

### *4.1 Sample and Data Sources*

Our sample includes virtually all listed UK firms. Our data result from merging three databases: (i) the Manifest database provides us with detailed information on the individual executive and non-executive directors: the presence of female directors (*Female)*, director characteristics (*Executive Director Age and Director Tenure*), Remuneration (*Total Pay, Base Salary, Bonus, Equity-based Pay*), and governance data (*Board size, Non-executive Directors (%), Female Directors (%), Audit Committee Presence, Nomination Committee Presence, Remuneration Committee Presence, Top-3 Remuneration Consultant Advice, CEO/Chairman Duality, Firm Risk*), (ii) the BoardEx database is used to verify and complement the Manifest data, particularly in relation to the position characteristics (*CEO, Deputy CEO, Executive Chairman, Finance Director, COO, Commercial Director*) and (iii) Datastream from which we collect data on performance (*ROA, Tobin's Q*), ownership structure (*CEO Ownership, Executive Ownership (excl. CEO), Non-Executive Ownership, Corporate Ownership, Pension Fund Ownership, Individual & Families Ownership, Institutional Ownership*), and various firm characteristics (*Free Cash Flow, Sales Growth, Leverage*), as well as index membership of corporations (*FTSE100, FTSE250, FTSE Small Cap*) and the industry.

In total, we dispose of 45,639 individual-year observations for executive directors, including 12,011 CEO observations.[2] The data set covers a time period of 12 years (from 1997 up until 2007).[3]

### *4.2 Variable Description*

***Compensation Measures***

The primary dependent variables comprise total year-end compensation and its components: (i) base salary, (ii) bonus, (iii) long-term incentive pay, calculated as the sum of the Black-Scholes value of stock options awarded and the total value of long-term incentive plans (LTIPs), and (iv) the ratio of short-term versus long-term pay, calculated as base salary plus bonus, divided by long-term incentive pay. Figure 5 shows the remuneration and mean gender pay gap for executive directors (excluding the CEOs) for the whole sample and by corporate size (categorized by index membership: FTSE100, FTSE250, FTSE Small Caps, and FTSE Fledglings). Across all firms, we first observe that the male executives earn about £494k, consisting of a fixed salary of £170k, an average bonus of £91k, £194k in equity-based pay, and about £40k in other types of compensation. Female executive directors earn on average about a quarter less – only £366k, and each of the pay components is lower than that of their male counterparts. A second observation from Figure 5 is the strong positive relation between firm size and remuneration: executive directors in the FTSE100 firms earn almost the double than FTSE250 executives, three times as much as executives of FTSE Smallcaps, and about five times as much as the executives of FTSE Fledglings. Third, Figure 5 shows that the gender pay gap exists for all categories of companies, save the FTSE 100 firms. We show a similar graph for CEOs:

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[2] The CEO sample includes the highest-ranking director (e.g. managing director), in case the firm does not have a manager who is formally called the CEO.

[3] We made these adjustments to the financial year length: i) in case the reported financial year length deviates from the standard assumption of 365 days, we adjust the accounting and remuneration information accordingly, ii) when a financial year does not coincide with the reported calendar year, we apply the following rule: if the reported financial year end lies within the first six months of a given year, the entry belongs to the preceding calendar year, whereas when the yearend lies within the last six months of a given year, we relate the information to the current calendar year, and iii) to take care of inflation, all data are in 2007 real terms. The UK consumer price index UK is from the Office for National Statistics (http://www.ons.gov.uk).

Figure 6 shows the average total pay for male and female CEOs is very similar (£895k versus £909k) although the medians are more apart (£397k for male CEOs and £340k for female ones). The gender pay gap whereby male CEOs are paid more is significant for companies of different size categories (FTSE100, the FTSE Small Cap, and the FTSE Fledgling) – a male FTSE100 CEO earns on average a total of £2.74 million, while a female CEO earns £2.27 million. The pay gap is inversed for FTSE250 firms.

[Insert Figures 5 and 6, about here]

***Treatment and Discrimination Variables***

Our treatment variable is a dummy variable (*Female*) that is equal to one for a female executive director/CEO, and zero otherwise. Similarly, we will use the female dummy in our Tobit models (see below) to examine the effect of gender-based discrimination. In a second step, we interact our female dummy with a number of variables, such as: (i) corporate performance, (ii) managerial positions within the firm, and (iii) the advice of a top-3 remuneration consultancy.

The control variables on executive position, director characteristics, governance, performance and risk, ownership concentration, and firm characteristics are enumerated in Section 4.1.

### *4.3 Treatment Effect Estimation*

To answer the question "Are female top managers discriminated in terms of pay based on their gender?", we use treatment effect estimations to compare the average pay outcome e.g. the total compensation of females, under the supposed gender-based treatment ('discrimination') to the average pay outcome of males ('controls'). If we were able to observe both pay outcomes for the same individual (e.g. a female executive), the average treatment effect (ATE) – the effect of gender-specific treatment - on compensation could be calculated as the difference in compensation between the individual under the treatment and the individual in the control sample. However, since we only observe female directors that receive a supposed gender-specific

treatment (discrimination in pay), we substitute the unobserved untreated female managers by male managers as our control group and estimate the average treatment effect on the treated (ATT), which gives us the expected difference in compensation for a female director.

To reduce the selection bias in our treatment effect estimation, we take into account a whole vector of variables including directors' age and tenure, position, firm size, industry, and year. This enables us to compare the average difference in our pay variables of female and male managers who are similar in observed characteristics except gender. We assume that we observe all variables that affect both the treatment and the outcome (*unconfoundedness assumption),* and equally that we observe both treated and controls with similar values concerning the observed characteristics (*overlap*).[4] That is, we assume that by conditioning on our set of observables, we are able to remove differences in the pay outcomes in the 'untreated' state between female and male executives. The unconfoundedness assumption states that the pay outcome in the 'untreated' case is independent of the treatment (gender-based discrimination), conditional on our set of observable characteristics. Put differently, the assumption is here that the pay of an executive director of the same age, position, experience, in a firm of similar size, in the same year and industry is unrelated to what it would be in the case of discrimination. According to Black and Smith (2003: 109): "*The key difference between matching and linear regression is that regression makes the additional assumption that simply conditioning linearly on X* [the control] *suffices to eliminate selection bias.*" The overlap assumption means in our case that for each covariate, there must be an executive who does not get treated/discriminated.

As manual matching on many covariates simultaneously is not straightforward, we calculate a single propensity score to reduce the number of dimensions to one (in line with Rosenbaum and Rubin (1983)). The propensity score expresses the propensity of the treatment given the observed covariates. For the estimation of the propensity score, we rely on a logit model of our observable characteristics on our treatment variable. We then match treated observations with controls similar in their propensity score. According to Rajeev and Wahba (2002), matching

[4] Possible unobserved heterogeneity, such as position-related ability, negotiation skills, and motivation are taken up by the error term of the treatment effect estimation.

implies three major decisions: First, there is the choice of the applicable matching method. Nearest-neighbor matching is still the standard procedure - according to Sianesi (2011) who also discusses radius, kernel-based and local linear regression-based matching - in which an individual is matched to a control such that the distance between their propensity scores is minimized. Second, there is the issue of *matching with or without replacement.* Matching with replacement minimizes the distance between the propensity scores of the treated and control observations, which in turn leads to a lower bias, but the precision is typically lower than in the case of matching without replacement, and the final sample may comprise duplicate observations of the same match. In contrast, the downside of matching without replacement is that the order of matching may become important. By random ordering as well as by recalculating standard errors, the latter drawback is reduced (Caliendo and Kopeinig, 2005). Third, one has to decide on the number of comparables: matching with a single comparable ensures the smallest distance in propensity scores between treated and control, and consequently yields the lowest bias but it decreases the precision (Rajeev and Wahba, 2002). In contrast, matching with several controls has the advantage that it is based on more information, which yields a higher precision, but it comes at the cost of a higher bias.

The results in this paper are based on nearest-neighbor matching to minimize the bias in our estimation, and on single matching following the argument of Imbens (2004) that relying on a single match yields the lowest bias although at the cost of a small decrease in precision. We match without replacement after randomizing our observations and re-estimating standard errors using bootstrapping. To verify the robustness of our results, we subsequently also match with replacement, but the results do not change significantly.

### *4.4 Tobit Regression*

As roughly one quarter of the executive directors and CEOs do not receive a bonus in a given year, we address censoring following Amemiya (1973) by means of a Tobit regression framework:

$$\mathrm{Y_{it}} = \alpha + \boldsymbol{\beta_1} \times \boldsymbol{Female\ Presence_{it}}$$
$$+ \beta_2 \times \mathrm{Position_{it}} + \beta_3 \times Director\ Characteristics_{it}$$
$$+ \beta_4 \times \mathrm{Governance_{it}} + \beta_5 \times \mathrm{Performance_{it}} + \beta_6 \times \mathrm{Ownership_{it}}$$
$$+ \beta_7 \times \mathrm{Firm\ Characteristics_{it}} + \beta_8 \times Sector_k + \beta_9 \times Time.$$

The dependent variable $Y_{it}$ is the logarithm of total compensation at year-end in real terms (at the end of our sample period). We also use as dependent variables (the natural logarithm of): (i) base salary, (ii) bonus, (iii) long-term pay, and (iv) short-term pay (sum of base salary and bonus) over long-term pay (equity-based pay). *Female Presence* will also be interacted with performance, position, and governance characteristics. The *Position* variables are equal to one if a director holds a certain position and the model also comprises *Director Characteristics*, *Governance* variables, *Performance*, *Ownership*- and *Firm characteristics* (for definitions, see Section 4.1). All regressions include sector and year dummies and we adjust all the standard errors for clustering at the position-level.

## 5 Results

### *5.1 Sample Statistics*

The median board of directors of UK listed companies comprises 9 directors (for FTSE 350 firms, the median is 11) with 4 executive directors (also 4 in FTSE 350 firms). In addition to the CEO, the finance director (CFO) is frequently a board member (in about 80% of the listed firms). Other executive directors on the board are the deputy CEO, the commercial director, the chief operating officer (COO), and an executive chairman (see Table 1, panel A). Only 2% of the CEOs in listed firms are women, and only 4% of the other executive directorships are occupied by female managers, most of which (85%) are CFOs.

On average, the total compensation across all listed firms (from FTSE100 firms to FTSE Fledgings) awarded to executive directors (excluding the CEO) amounts to about £528,810, lower than that of a CEO who earns on average £801,280. Differences in remuneration between male and female executive directors (excl. CEO) occur both at the level of total pay and the various pay

components: male managers earn £418,650, more than female executives (£391,590), a difference largely driven by Base Salary and Bonus. Interestingly, total pay awarded to female CEOs (£865,010) typically exceeds (but not significantly so) that of their male counterparts (£619,200). The information from Figure 6 has revealed this does not occur across all types of firms but is limited to FTSE250 firms. Female CEOs compensation packages comprise a higher base salary (£251,020) and bonus (£159,120) than those of male managers. The data also show that CEOs are on average older and more experienced than the average executive director, and that female executive directors and CEOs are 4 to 5 years younger and have lower tenure in their position than their male counterparts (Panel A of Table 1). Sixteen percent of our executive director observations come for the FTSE100 firms, 31% from the FTSE250, 33% from the FTSE SmallCaps, and the remainder from the FTSE Fledglings.

Firms with female executive directors dispose of larger boards, more frequently have a formal nomination committee and seek the advice of a top-3 remuneration consultant (lower for CEOs), and violate less frequently the separation of the positions of CEO and (non-executive) Chairman (see Table 1, Panel B). There is some difference in corporate performance between firms with and without female top managers whereby more profitable firms (in terms of Tobin's Q) have more female top managers on the board. In the case of firms with female executive directors, lower equity stakes are held by executive directors, by individuals and families, and institutions. It seems that female directors are more likely to be on the board of firms with a higher leverage and board size, with fewer governance problems and with a better performance.

In firms with female CEOs, we find more female directors, stronger performance (both in terms of accounting and stock price performance), stronger ownership concentration (in the hands of executive and non-executive directors, and other companies), lower leverage, and higher free cash flows (Panel B of Table 1).

[Insert Table 1, about here]

### *5.2 Treatment Effect Estimations*

Female executives (who are not the CEO) do indeed receive a significantly lower compensation than male managers with the same position, age, experience (tenure) in a firm of similar size, and within the same industry, and in the same year (Column (1) of Table 2): their base salary is significantly lower by about £19,947 (or $\left[e^{(-0.164)}\right] - 1 = -15.13\%$); their bonus is £25,604 (or $\left[e^{(-0.220)}\right] - 1 = -19.75\%$) lower (in line with Kulich et al. (2011) who report that female CEOs earn -£33,510 less). As for incentive compensation (which is equity-based remuneration), we find the biggest difference between male and female directors: women top executives earn £222,043 (or $\left[e^{(-0.568)}\right] - 1 = -43.34\%$) less. Taken together, female executives earn a significant amount (of £269,069) less than the male executives with a similar profile. Over a five-year time span – which is the average tenure period of our sample of executive directors - the difference ascends to more than £1.3 million. All these results are statistically significant at the 99%-confidence level.[5]

The analysis shows that the total compensation of female CEOs is –22.74% lower for female CEOs (model (2) of Table 2), but this results is only significant at the 10% confidence level for two reasons: a. there are only relatively few female CEOs present in UK listed firms (218 firm-years) and b. in some types of companies (based on index membership) the pay gap is negative while it is positive in others (Figure 6). When we delve deeper and examine the treatment effects for CEOs for FTSE100, FTSE250, FTSE SmallCaps and FTSE Fledglings, we find no significant differences between male and female CEO's total compensation and its components and structure (the only exception is that in SmallCaps, female CEOs earn less as they are given less equity-based pay). The fact remains that – contrary to what the raw data suggest – we hardly find any significant results when controlling for experience (tenure) in this position, age, firm size, time, and industry. Using propensity scores Bugeja, Matolscy and Spiropoulos (2012) also fail to find a gender pay gap at the CEO level for a sample of large US firms.

[5] In column (1), the pay components as a percentage of total compensation for male and female top managers do not differ significantly as the female directors receive both less component compensation (the numerator) and less total compensation (the denominator).

Overall, the results show that the average female executive director receives significantly less pay, which is visible in all components of pay. This supports our hypothesis H1a, but this gender-related discrimination is restricted to executive directors excluding the CEO.

[Insert Table 2, about here]

### *5.3 Tobit Models*

As the compensation measures are left-censored, we examine whether the treatment effect results are upheld when estimating Tobit models to study differences in pay-for-performance for male and female top managers.

***The Compensation of Executive Directors and CEOs***

We examine what determines total compensation (and its components) and adjust for year- and industry-fixed effects while also allowing for intra-group correlation by clustering the standard errors at the position level. Model (1) of Panel A in Table 3 shows that female executive directors receive a 17.3% lower total compensation than their male counterparts. This finding is roughly in line with the result from the treatment effect estimation of -12.54%. Consequently, these results fail to reject hypothesis H1a in that female executive directors earn less than male top managers. This gender pay gap in total pay is visible across all pay components: Base salary is 12.3% lower (model (2)), Bonus is 24% less (model (3)), and Long-Term Pay is 33% less (model (4)). Model (5) shows that there is no difference in the pay structure, as proxied by the proportion of short-term on long-term pay: the reason is that both the numerator and denominator are lower for female managers. These results reject hypothesis H2a as although female directors' short-term and long-term compensation are lower than those of male managers, the composition (the relative importance of short versus long term incentives) does not differ.

While the regressions correct for the managerial position (whereby the position of Executive Chairman is the left out benchmark), we observe that of all the executive directors (excluding the CEO), the deputy CEO is typically paid most (8.4% more than the executive

chairman, 10% more than the COO, about 17% more than the CFO, and 34% more than the commercial director) (see Model (1)). Models (2) to (4) show a similar picture for the differences in base salary, bonus, and equity-based pay, respectively, but exhibit more variation. Interestingly, the age of an executive director is negatively related to total compensation and its components, which suggests that experience is not priced in the remuneration contracts (note that the variable Tenure (in the position) is also not statistically significant). Model (5) demonstrates that younger executive directors are offered proportionally more Long-Term Pay which creates stronger incentives for them to focus on a longer time window to create value. An executive who is ten years younger than the average executive director receives 11% more total compensation (Model (1)). Although position tenure is not strongly related with age (these models do not suffer from multicollinearity), it is not significantly related to compensation.

Various internal governance measures are correlated to higher compensation in all its forms (Models (1)-(4)): board size, the proportion of non-executive directors on the board, and the percentage of female directors on the board. These variables are also related to compensation contracts that are geared more towards the equity-based pay rather than the short-term pay components (Model (5)). While the presence of an Audit Committee is related to a lower total compensation (Model (1)) and to higher long-term incentive pay (Models (4) and (5)), the presence of a remuneration committee is largely uncorrelated with total remuneration and its components (with exception of the bonus, which is lower in the presence of a remuneration committee (Model (3)). Although these control variables are significant when lagged, it is important to point out that we interpret the results as correlations and not as causations because the fact that the board comprises one or more female director does not necessarily mean that these female directors are instrumental in setting a higher compensation for the female executive or CEO. It may well be that the causality goes from good performance to the simultaneous adoption of good corporate governance practices (which may include striving for a gender balance at the board level) and the paying of higher compensation for top executives.

Interestingly, when the advice of a top-3 remuneration consultant is sought, executive director remuneration is significantly higher (by 13.6%) as are the remuneration components;

Base Salary, Bonus, and LT-Pay rise by 7%, 12.4%, and 13.3%, respectively. This could imply that top remuneration consultants transfer pay increases in one firm or industry through rising benchmarks in their client networks and thus create a spiral of increasing compensation as suggested by Renneboog and Zhao (2011). CEOs who combine their function with that of chairman do not receive more total pay but receive a compensation package that is more geared towards the short-term pay (base salary and bonus) and receive lower equity based pay (Models (1) to (5)).

We also demonstrate that executive directors leading risky firms are paid more; they receive higher base salaries (Model (2)) but also larger equity-based pay (Models (4)), and the long-term dimension of the contract dominates (Model (5)). Total compensation is 56% higher in firms where firm risk (as measured by the standard deviation of cash flows) is 10% higher than average. The performance variables indicate that compensation is strongly performance dependent: a 5% increase in accounting performance (ROA) is associated with a corresponding increase in the bonus of 8% (Model (3)) and in the LT-pay of 3% (Model (4)). Equity-based Pay is also positively associated with Tobin's Q: a 10% increase in Tobin's Q is related to a 37% higher LT-Pay (Model (4)). At the same time, a high Q is associated with a greater focus on Long-Term Pay, as indicated by the coefficient of -0.049 for ST/LT-Pay (Model (5)).

Ownership concentration held by outside shareholders such as corporations, individuals and families, as well as institutions are typically associated with lower (short and long term) compensation which implies that strong owners are restricting (excessive) remuneration.

[Insert Table 3, about here]

While controlling for age, board tenure, board structure, external consultant advice, performance, ownership concentration by type of shareholder, growth, firm size, risk and leverage, we show in Panel B of Table 3 that female CEOs are paid 8.4% less than male CEOs (Model (1)). This is mainly due to the fact that they receive an 8.2% lower Base Salary (but otherwise they receive similar bonuses and incentive pay). So, it seems that female CEOs face considerably less pay discrimination than the other female executive directors who are board

members. The results from Panel B are partially consistent with hypothesis H1a in that female CEOs earn less than male CEOs (but only in terms of base salary), and not with hypothesis H2a as the composition of the compensation contracts (short versus long term) is similar for male and female CEOs.

Older CEOs and CEOs with longer tenure receive a compensation contract that is less long-term oriented (Models (4) and (5)). The governance variables yield similar results as the ones in the executive director regressions of Panel A. As before, while controlling for firm size, the presence of a top-3 remuneration consultant is related to a 15% increase in total compensation (and its components).

Risky firms pay more, especially in terms of cash compensation: a firm which is 10% more risky pays a 9.3% higher total compensation to the CEO (Model (1)), a roughly 9% higher bonus (Model (3)) and focuses the CEO on the short-term (Model (5)). Panel B of Table 3 shows that CEO compensation is also performance-sensitive (both in terms of ROA and Q). In line with the findings for the executive directors, strong ownership concentration reduces total pay and the composition of remuneration. A CEO holding a large share stake receives lower total pay (Model (1)) and fewer long-term incentives may be necessary which is reflected in lower equity-based pay (Model (4)). When the firm experiences strong sales growth, larger bonuses and stronger incentive-based pay are granted but free cash flow is negatively associated with compensation in general, and especially with equity-based pay.

***Performance Sensitivity of Executive Directors and CEOs***

Is the compensation of female top managers more performance-sensitive than that of their male counterparts? We investigate this issue by including female director/CEO-performance interaction terms while adjusting for year and industry fixed effects and allowing for intra-group correlation by clustering the standard errors at the position level. Panel A of Table 4 confirms that (i) female executive directors are paid less and (ii) compensation is sensitive to performance (short-term performance depends on accounting measures and long-term performance on a market-based benchmark). Still, we reject hypothesis H2b because the compensation awarded to

female executive directors is not significantly less performance-sensitive than the one of male executives. Panel B of Table 4 presents the corresponding results for CEOs. While we find evidence which fails to reject hypotheses H1a (female CEOs earn less) and H2a (the compensation contracts are different with lower bonuses and lower long-term incentives for female CEOs), we also exhibit strongly significant differences in performance-sensitivity between female and male CEOs. In contrast to hypothesis H2b, however, female CEO remuneration contracts are not less but are actually more performance sensitive: both the interaction terms Female*ROA and Female*Tobin's Q are positive and statistically significant for total compensation (Model 1), bonus (Model 3) and equity-based compensation (Model 4)).[6]

[Insert Table 4, about here]

***Female Non-Executive Directors on the Board***

We investigate whether the discrimination of female top managers is reduced if female non-executive directors serve on the board and examine whether the contract structure and performance sensitivity is different for such firms. We re-estimate the models in Tables 3 and 4, but we restrict the samples to those firms that have boards comprising female non-executive directors in the preceding year (when the compensation package was decided upon). Model (1) of Table 5 confirms that female executive directors are still discriminated in terms of total compensation: on average, their total compensation is about 10.9% lower than that of male executives. It should be noted that the discrimination is significantly less than in firms without female non-executive directors where female executives earn 17.3% less than their male colleagues (cf. Table 3, Panel A, Model (1)). When we investigate the compensation of a female CEO in a firm with at least one female non-executive director on the board (present at the time when the contract was made, thus in the previous year), we find that she receives a 20.2% higher total compensation than male CEOs (Model (3)).

[6] When estimating marginal effects, we find these results to hold in all cases at the 1%-level of significance.

These results of Table 5 indicate a reduced discrimination for female executives by about 6.4% (i.e. 17.3% minus 10.9%) in firms with female non-executive directors and no discrimination for female CEOs as female CEOs even earn more than their male CEOs. It is important to note that we do not state these findings in terms of causation: in other words, it may be that female non-executive directors are instrumental in providing their female executive colleagues a higher remuneration, but it could also be the case that firms that appoint female non-executives do not discriminate female CEOs and executive directors in terms of compensation.

We re-estimate Models (1) and (3) and include the female executive/CEO-performance interaction terms. Model (2) of Table 5 shows that, as for the whole sample, the contracts of female executives are not different in terms of performance-sensitivity from those of their male counterparts. In firms with at least one female non-executive director on the board, we demonstrate that the contracts offered to female CEOs are more sensitive to both accounting and market-based performance (Model (4)). These findings are in line with our hypothesis (H3) that the presence of female non-executive directors is correlated with a higher pay for female CEOs.

Most of the coefficients of the control variables are similar to the ones of Tables 3 and 4, and are statistically significant. The advice of a top-3 remuneration consultant is related to an increase of roughly 11% for both executives and CEOs. The coefficients of both our ownership variables and our firm characteristics are comparable in direction, size, and significance with the results of our main model.

[Insert Table 5, about here]

***The Effect of Industrial Segregation***

Is the gender pay gap larger in industries that employ a relatively high proportion of male managers? We first determine the industries with the largest employment of male executives, which are IT (22.6%), Food (17.0%), and Financial Services (10.9%). As before, we correct our models for industry effects and year-fixed effects and cluster standard errors at the position level. We document that a female executive director employed in an industry with a high proportion of male managers receives an average total remuneration which is 6.7% lower than that of male

executives (Model (1) of Table 6). This is a considerable smaller pay gap than what we observe in our main model (Table 3, Panel A, Model (1)). When we turn to CEOs in Model (3), we demonstrate that female CEOs receive on average a 7.4% *higher* total compensation. These results contradict hypothesis H1b, which states that the gender wage gap is larger in industries with a high concentration of male managers. The results for the other variables are largely comparable in size, sign, and significance to the results of our main models of Tables 3 and 4.

[Insert Table 6, about here]

***The Effect of Remuneration Consultants***

We have already documented that when firms attract remuneration consultants to give pay advice, the total compensation (and the pay components) are higher. The question we now ask is whether remuneration consultants reduce the gender wage gap? Models (1) and (3) of Table 7 show that female executive directors and female CEOs can expect to receive a total remuneration that is lower by about 11.8% and 27.8%, respectively. The remuneration of female executive directors (excluding the CEO) is not performance-sensitive, but the presence of remuneration consultants is negatively related to their pay. The picture for CEOs is very different: the female-performance interaction terms are positive and statistically significant at the 1%-level, which implies that female managers' compensation is more performance-sensitive. In addition, the female-interacted presence of a top-3 remuneration consultant is significantly and positively associated with total remuneration. In other words, the advice of a top-3 remuneration consultant seems to reduce the level of discrimination for female CEOs: she can then expect an increase that closes the remuneration gap.

In sum, these results provide mixed evidence for our hypothesis H4 which states that top-3 remuneration consultants reduce the pay gap: while we find this to be true for CEOs, it is not the case for the other executive directors on the board.

[Insert Table 7, about here]

### *5.4 Robustness Checks*

We perform some robustness checks to validate our results. For the sake of brevity, we do not report the associated tables.

***Matching with Replacement***

Matching with replacement usually leads to a minimization of the distance between the propensity scores of the treated and the untreated, which typically results in a lower bias. However, the disadvantages of matching with replacement are that the precision is typically lower than in the case of matching without replacement and that the final sample consists of duplicate observations of the same match. A re-estimation of the treatment effect based on matching with replacement yields results that are qualitatively unaffected.

***Increasing the Number of Comparables***

In a second step, we not only employ 1-on-1 matching, but also rely on 1-on-3 matching, i.e. we compare the pay outcome of a female executive director to the average outcome of the 3 closest male matches. Matching with a higher number of comparables has the advantage that one takes the information of more observations into account, which yields a higher precision, but trades this off with the introduction of a bias. Still, the results of our treatment effect estimation are very similar.

***Focusing on Newly Hired Executives***

In our current sample, we include all director observations independent of whether they have been hired recently or whether they have a high tenure in their firm. When we reestimate our main Tobit models of Tables 3-6 on a subsample of newly hired executive directors, we find that our results remain largely unaffected.

## 6. What about children?

The scarcity of family-related information and the unwillingness of (executive) directors to share such information creates a problem for this type of analysis as private characteristics are protected under English law from unauthorized disclosure. The fact that we have (no choice but) to rely on director's self-reported information introduces a selection bias, such that the results should be interpreted with caution. We collect all available private information from two leading bibliographical databases (Who's Who UK, and Marquis Who's Who)[7] for our sample of female executive directors and the matched sample of male managers. We then tried to complement this information, by gathering mail addresses from CapitalIQ and sending out 1,078 questionnaires by snail mail as well as a reminder via email. The response rate was a mere 3.7%[8] with 27 men and 13 women responding to the survey. We measure the effect of children by means of binary variables capturing whether a director has children (1) or not (0). The marital status variable equals one in case of marriage[9]. Panel A of Table 8 ('original data') shows the descriptive statistics of the data on children (including adoptive children). We have 895 director-year observations for 733 male and 162 female managers. We have not a single man without children, and also do not observe female directors with more than 4 children. The average male and female director has 2 children. Panel B indicates around 60% of both male and females are married.

[Insert Table 8, about here]

An endogeneity problem may arise in that the decision to have a child or to get married may not be independent from an individual's professional potential. However, the survivorship bias in our sample may not be a problem as long as one realizes that we study the pay gap of male and female executives who made a successful career and reached the top of the corporate hierarchy. We thus study the relation between the pay gap and remuneration conditional on

[7] Who's Who UK is a bibliographical database on more than 30,000 individuals in the UK and is published annually since 1849. Marquis Who's Who have been collecting biographical data since 1899 and include information on corporate executives from around the world.

[8] This result may not surprise because directors have no interest to provide private information, as some who were manager/director at one point in our sample period had left the company and it was often against company policy to participate in surveys or to forward the questionnaire to the manager (which happened in 11.1% of the cases).

[9] The relation between divorce and career (and remuneration) would be hard to test given the small number of divorces in our sample (which may be subject to disclosure bias).

*proven* career success. A study on parenthood at the early stages of a career and the career evolution is beyond the scope of this study.

In order to address the problem of survey non-response, we turn to Multiple Imputation (MI), which can make reliable randomization-based inferences on missing values (Barnard and Rubin, 1999) and is more efficient than list-wise deletion that may result in larger standard errors, and hence wider confidence intervals and lower explanatory power. In our case, data is missing due to various reasons, including but not limited to the willingness to give away information on private characteristics. Missing information on the number of children or on marriage may also depend on gender, age, and position of an individual – variables that are present in the dataset. Therefore, we consider our data to be missing at random (MAR) – a precondition for MI.[10] While treating the imputed values as known in the analysis often underestimates the variance of the estimates and overstates precision, this problem is accounted for by the creation of multiple imputations, i.e. generating different sets of plausible values for the missing data. There seems to be consensus that five imputations may be sufficient to obtain valid inferences (Schafer and Olsen, 1998; van Buuren et al., 1999). Panel A of Table 9 reports the average compensation of all executives with and without children. Whereas only 2% of the male executives do not have children, almost 18% of the female executives are not parents. We observe that total remuneration and all its components are higher when male and female managers have children (relative to managers without children). The difference in average salaries between male and female managers without children is large, with the former earning £382k more. Similarly, the difference in average total pay for managers who are parents also suggests a pay gap of £291k. Panel B shows the average compensation by marital status. Base salary, bonus, and total compensation are significantly higher for married female managers than those of unmarried female executives, but do not differ significantly between male and female directors. These

[10] Even though we may expect departures from MAR, the performance of MI is unlikely to be seriously reduced (Schafer and Graham, 2009). In fact, even an erroneous assumption of MAR may have a very limited effect on estimates and standard errors (Collins, Schafer, and Kam, 2001).

descriptive statistics give some initial insights but call for a more thorough matching analysis the results of which we show in Table 10.

[Insert Table 9, about here]

Model (1) in Table 10 presents the results of a treatment effect analysis on the imputed sample of executive directors (excluding CEOs) and shows that virtually all components of pay are lower for female managers. Notably, we observe a 16.4% reduction (–£21,454) in base salary, a 26.5% reduction (–£40,394) in bonus, a 57.5% reduction (–£98,461) in equity-based compensation, as well as a 16.6% reduction (–£161,011) in total compensation. In short, these results are very similar to our main model (Model (1) of Table 2), which gives credibility to the results based on the smaller sample with imputed data. Model (2) of Table 10 captures the pay gap after accounting for parenthood. We observe that having children does not close the pay gap: the wage gap in base salary is even somewhat larger (–£39,394) corresponding to a reduction in base salary of roughly 25%; the bonus gap is somewhat smaller (–£36,253) and is equivalent to a lower bonus of -36%; but the equity-based pay gap is large and amounts to 64.8% or –£186,000. Consequently, for female managers the total compensation is 33% lower which stands for an amount of –£267,059 per annum. Model (3) accounts for matching based on marital status which is strongly correlated with the variable children as our data do not comprise female managers with children who were not/had not been married. Therefore, marital status does not close the pay gap either: base salary remains £27,902 lower, equity-based pay is £132,070 lower, and total compensation is £195,182 lower, representing a reduction of 23.2%.[11]

We conclude that neither the number of children nor marital status close the observed gender pay gap for top executives (excluding the CEO). On the contrary, for married female managers with children, the pay gap is even larger. It is possible that the parenthood decision

[11] In order to assure that our analysis holds, we not only perform the treatment effect analysis on the average of our imputed dataset, but also on all the imputed data, as well as on our original dataset using mean substitution. Our results remain in all cases very similar.

harms the female career at the early career stages and that these arrears are never made up even by successful female managers who reach the top of their profession.[12]

[Insert Table 10, about here]

## 7 Conclusion and Discussion

The existence of the gender wage gap and the possible causes thereof remain an important and hotly debated topic. The literature proposes an impressive range of theories that may help to explain the existence of a gender wage gap, such as the 'sticky floors' idea (Booth et al., 2003), the 'glass-ceiling' concept (e.g. Arulampalam et al., 2005), occupational and industrial segregation (e.g. Blau and Kahn, 1994, Allen and Sander, 2002), the impact of corporate performance (Kulich et al., 2011), behavioral biases (e.g. Eagly et al., 1992, Eagly and Karau, 2002, Kulich et al., 2011), and the effect of pay consultants (e.g. Bender, 2003, Cadman et al., 2010). Nevertheless, empirical testing of these theories remains limited, because the numbers of female top managers remains scarce.

To address the idea of female discrimination at the pay level, we have built a very large dataset that includes details on the compensation of male and female executive directors for virtually all companies listed in the UK from 1996 until the start of the financial crisis (end of 2007). This enables us to put many of the above-mentioned ideas on the gender pay gap to the test and examine discriminatory practices for top level managers: CEOs and the other executive directors. We study whether differences are attributable to occupation and segregation, differences in pay-for-performance sensitivity, corporate governance structures, ownership structure, and the influence of remuneration consultants.

We use a treatment effect estimation to compare the average pay e.g. in total compensation of female top managers (CEOs and other executive directors), under a gender-based treatment ('discrimination') to the average pay outcome of male top managers ('controls') that are similar in

[12] We had not found a pay gap for CEOs and adding a children/marital status analysis, does not change our earlier findings.

a number of observable characteristics. In particular, we control for firm size, position (CEO, finance director, commercial director, COO, and others), experience (age and tenure in that position), industry, and time. The advantage of a treatment effect estimation over and above a simple OLS regression is that we do not assume a linear relationship between our independent variables and the level of pay, but instead we account for heterogeneity among individuals. The results of the treatment effect analysis confirm that female executive directors (excluding the CEO) are discriminated against in their base salary, bonus, long-term incentive compensation, and hence also in the total level of compensation. For example, female executive directors can on average expect to receive a 15% lower salary and 20% lower bonus, which translates respectively into about £20k and £25k less pay. The largest difference is in equity-based pay, which is £222k lower than for the male executive directors (which do not comprise the CEOs). When correcting for the above mentioned observable characteristics (experience, industry, etc.), we find that female executives seem to be strongly discriminated as they earn about £269k less per year. As in our database that includes all the executive directors of listed UK companies, the average tenure is about 5 years, female directors are paid £1.3 million too little over this period. In terms of the contract structure – a focus on short or long term pay - the contracts do not differ.

Remarkably, this gender-based discrimination seems to be largely restricted to executive directors, as we do not find compelling evidence that the total compensation and the components of pay significantly differ between male and female CEOs. These results suggest indeed that gender equality in terms of pay at the very top – the CEO level - has been (nearly) achieved, but it also suggests that female executive directors at the sub-top level (but still at board level) continue to be discriminated. The reason for the discrimination at the executive director level but not at the CEO level is that executive directors are less visible as they are not the figureheads of the corporation.

We document that the contracts of female CEOs are more sensitive to both accounting and share price performance. This contradicts the findings of Kulich et al. (2011) who argue that female managers are considered to be more risk averse and are consequently offered contracts with lower performance sensitivity. As the other executive directors may be considered as less

responsible for the overall bottom line results, we find that their compensation is indeed less performance-sensitive.

Do female non-executive directors on the board improve the situation for the female managers? Our analysis shows that the gender-based pay gap is indeed somewhat lower in such firms. While some would regard this as evidence to plead for a minimum ratio of women on the board to tackle gender-based discrimination, it is important to interpret this result with caution because our analysis cannot discern how active non-executive female directors are in terms of reducing the glass ceiling and the female pay discrimination. It may be that it takes a specific type of firm (with corporate governance standards aiming at reducing gender imbalances) that both hires female non-executive directors and pays female and male top managers similar salaries (while controlling for those managers' specificities). Whereas Adams and Ferreira (2009) show that with a greater number of women on the board, both the board meetings' attendance ratio and forced CEO turnover in case of poor performance improves, they caution that gender diversity may have a negative impact on profitability and share prices. Moreover, recent Norwegian evidence suggests that the introduction of gender quotas incite firms to delist or avoid specific types of incorporation where gender quota are required as they want to avoid the high costs related to involuntary and potentially suboptimal board restructuring (Øyvind and Staubo, 2013). Lastly, when contemplating the introduction of binding gender quotas, it should be kept in mind that the pipeline of qualified women with sufficient experience at the upper management level may need to be built up in due time (in all listed UK companies, only 2% of the CEOs and 4% of all executive directors are female). Nevertheless, the introduction of a female quota may also send a strong signal to female executives by encouraging them to overcome the glass ceiling and thereby contribute to enhanced gender equality.

When examining industries with a high concentration of male executives, however, we observe that the gender wage gap is not greater which contradicts the idea that women are less appreciated in a dominantly male environment (as suggested by Allen and Sander (2002)). We also document that seeking the advice of top remuneration consultants substantially drives up total remuneration, and is beneficial for female CEOs as the pay gap is reduced in such firms.

However, we only find a pay gap reduction for female CEOs, but not for the female executive directors.

We study whether marital status and parenthood can explain the gender pay gap. We find that the pay gap for female managers who are married and who have children is larger (£267k and £ 195k per annum, respectively) than for managers without children.

Can we explain some of the remaining gender wage gap by position-related ability, negotiation skills, and level of motivation? Are the career choices of women conscious decisions taken at the household level? To what extent are the (male-oriented) expectations about the required managerial skills and the idea of femininity important to women and influence their professional life? Further research on those aspects of female participation to the top managerial labor market and the gender wage gap seems warranted.

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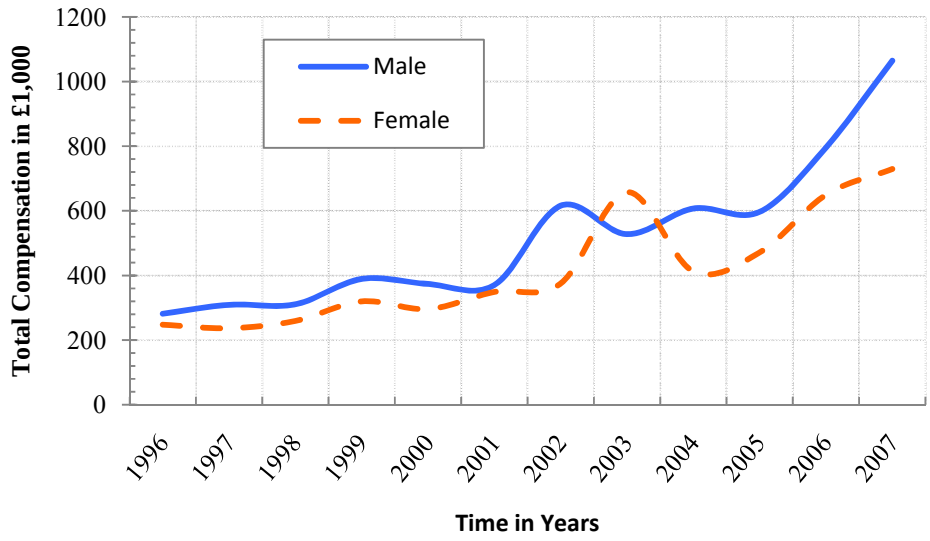
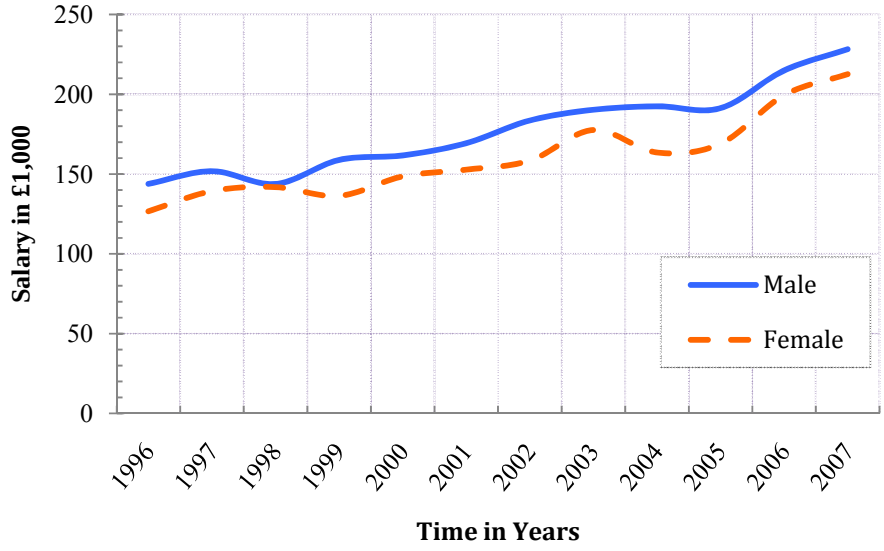
**Figure 1 Average Total Compensation Evolution of Top Managers in Listed UK Companies.**



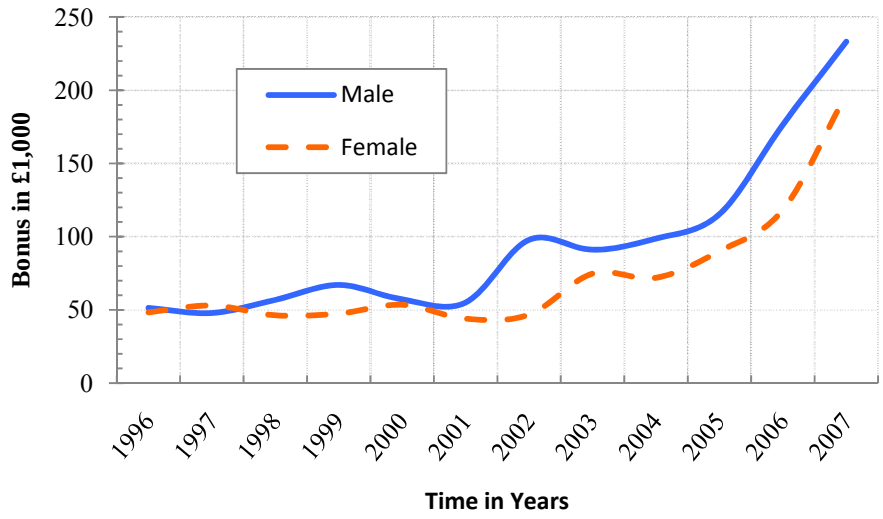

This figure shows the evolution of the average total compensation over time for both male and female top managers who are members of the board of directors of listed UK companies. The numbers are given in £1,000. Source: Boardex, Datastream, and Manifest.

**Figure 2 Average Basic Salary Evolution of Top Managers in Listed UK Companies.**



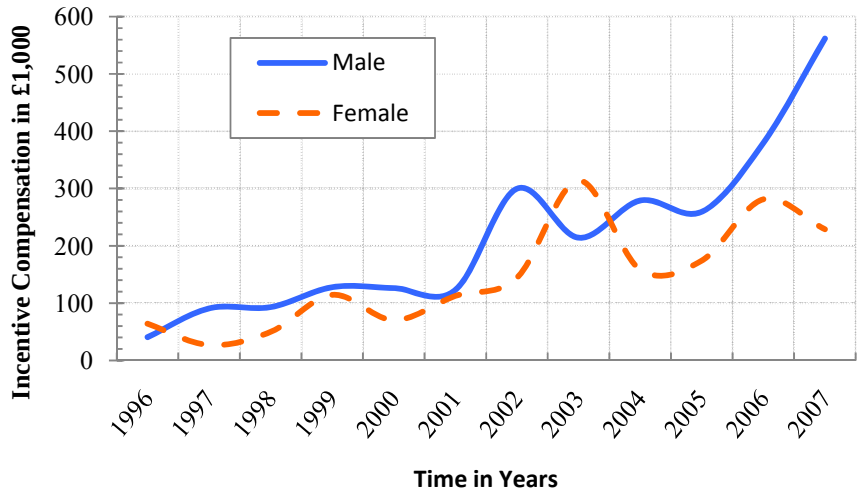

This figure shows the evolution of the mean basic salary over time for both male and female top managers who are members of the board of directors of listed UK companies. The average basic salary is given in £1,000. Source: Boardex, Datastream, and Manifest.

**Figure 3 Average Bonus Evolution of Top Managers in Listed UK Companies.**



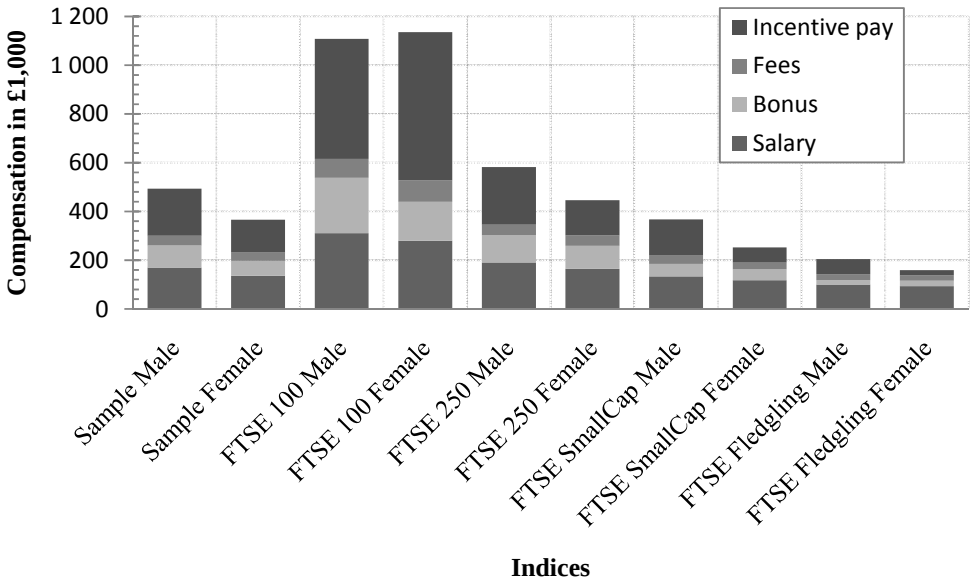

This figure shows the evolution of the total mean bonus over time for both male and female top managers who are members of the board of directors of listed UK companies. The average bonus is given in £1,000. Source: Boardex, Datastream, and Manifest.

**Figure 4 Average Long-term Compensation Evolution of Top Managers in Listed UK Companies.**



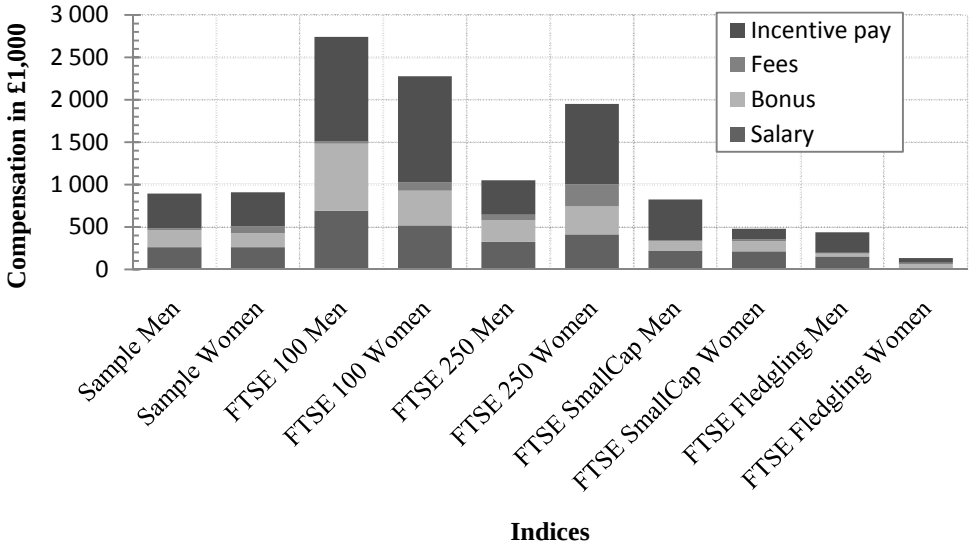

This figure shows the evolution of the total long-term incentive compensation over time for both male and female top managers who are members of the board of directors of listed UK companies. The average salary is given in £1,000. Long-Term incentive compensation is calculated as the sum of the Black-Scholes value of stock options and the total value of LTIPs (Long term incentive plans). The numbers are in £1,000. Source: Boardex, Datastream, and Manifest.

**Figure 5 Executive Directors (excl. CEOs): Average Total Pay by Index and Gender.**




The figure illustrates the average pay gap between male and female executive directors (excl. CEOs) for the sample and by index membership (FTSE 100, FTSE 250, FTSE Small Cap, FTSE Fledgling). Source: Own calculations based on Boardex, Datastream, and Manifest.

**Figure 6 CEOs: Average Total Pay by Index and Gender.**




The figure illustrates the average pay gap between male and female CEOs for the sample and by index membership (FTSE 100, FTSE 250, FTSE Small Cap, FTSE Fledgling). Source: Own calculations based on Boardex, Datastream, and Manifest.

**Table 1 Panel A: Descriptive Statistics: Director Characteristics.**

Panel A presents the director characteristics for the samples of executive directors (excl. CEOs) and CEOs, based on director-year observations. Panel B shows the firm characteristics for firms with only male executive directors/a male CEO, and for firms with one or more female executive directors/a female CEO (based on firm-year observations). Both Panel A and Panel B also present tests on the differences in means. Statistical significance at the 10%, 5%, or 1% level are denoted with *, **, and ***, respectively, for the difference between the mean descriptive statistics of firms with only male executives vs firms that have one or more female executive director; and firms with a male CEO vs firms with a female CEO. The data are from from Boardex, Datastream, and Manifest.

| | Executives (excl. CEOs) | | | CEOs | | |
|---|---|---|---|---|---|---|
| | All | Male only | Includes a Female | All | Male CEO | Female CEO |
| **Positions** | | | | | | |
| Deputy CEO | 0.06 | 0.06 | 0.04*** | | | |
| Executive Chairman | 0.07 | 0.08 | 0.01*** | | | |
| Finance Director | 0.78 | 0.78 | 0.85*** | | | |
| Commercial Director | 0.01 | 0.01 | 0.02*** | | | |
| COO | 0.04 | 0.04 | 0.05* | | | |
| Other Executives | 0.03 | 0.03 | 0.02 | | | |
| **Remuneration** | | | | | | |
| Total Compensation (in £1,000) | 528.81 | 418.65 | 391.59 | 801.28 | 619.20 | 865.01 |
| Base Salary (in £1,000) | 183.98 | 161.99 | 146.39*** | 242.88 | 207.53 | 251.02*** |
| Bonus (in £1,000) | 96.28 | 73.86 | 65.15 | 145.51 | 108.09 | 159.12** |
| LT-Pay (in £1,000) | 205.88 | 148.35 | 143.99 | 370.94 | 267.89 | 371.41 |
| ln(ST-Pay/LT-Pay) | 0.60 | 0.68 | 0.80 | 0.52 | 0.56 | 0.54 |
| **Director Characteristics** | | | | | | |
| Director Age | 49.59 | 49.59 | 45.00*** | 52.82 | 53.11 | 47.64*** |
| Director Tenure | 5.12 | 5.28 | 4.23*** | 5.76 | 5.88 | 4.19*** |
| FTSE100 | 0.16 | 0.09 | 0.11** | 0.09 | 0.04 | 0.08*** |
| FTSE250 | 0.31 | 0.31 | 0.25*** | 0.25 | 0.23 | 0.22 |
| FTSE Small Cap | 0.33 | 0.36 | 0.37 | 0.35 | 0.37 | 0.36 |
| **Female Presence** | | | | | | |
| Female | 0.04 | 0.00 | 1.00 | 0.02 | 0.00 | 1.00 |
| **Number of Observations** | 35,307 | 23,049 | 1,384 | 15,167 | 11,153 | 301 |

**Table 1 Panel B: Descriptive Statistics: Firm Characteristics.**

| | All | Firms with only male executive directors | Firms with one or more female executive director | All | Firms with male CEO | Firms with female CEO |
|---|---|---|---|---|---|---|
| **Governance** | | | | | | |
| Board Size | 9.02 | 8.30 | 10.42*** | 9.02 | 9.02 | 9.17 |
| Non-Executive Directors (%) | 55.94 | 54.55 | 58.63*** | 55.93 | 55.88 | 58.41 |
| Female Directors (%) | 4.75 | 0.00 | 13.94*** | 4.75 | 4.42 | 22.27*** |
| Audit Committee Presence | 1.00 | 0.99 | 1.00*** | 1.00 | 1.00 | 1.00 |
| Nomination Committee Presence | 0.83 | 0.80 | 0.88*** | 0.83 | 0.83 | 0.70*** |
| Remuneration Committee Presence | 1.00 | 1.00 | 0.99*** | 1.00 | 1.00 | 0.99 |
| Top-3 Remun Consultant Advice | 0.45 | 0.42 | 0.51*** | 0.45 | 0.45 | 0.34** |
| CEO/Chairman Duality | 0.09 | 0.10 | 0.06*** | 0.01 | 0.01 | 0.00*** |
| Firm Risk | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.37 |
| **Performance** | | | | | | |
| Return on Assets (Median) | 4.26 | 4.46 | 3.87 | 4.26 | 4.24 | 5.81 |
| Tobin's Q (Median) | 2.05 | 1.97 | 2.22*** | 2.05 | 2.04 | 2.61** |
| **Ownership** | | | | | | |
| CEO Ownership | 2.62 | 3.03 | 1.83*** | 2.62 | 2.63 | 2.06 |
| Executive Ownership (excl. CEO) | 2.43 | 2.61 | 2.08** | 2.44 | 2.38 | 5.09*** |
| Non-Executive Ownership | 2.21 | 2.19 | 2.24 | 2.21 | 2.13 | 6.71*** |
| Corporate Ownership | 8.07 | 8.17 | 7.87 | 8.06 | 7.97 | 12.72*** |
| Pension Fund Ownership | 0.34 | 0.37 | 0.29 | 0.34 | 0.34 | 0.26 |
| Individual & Families Ownership | 2.12 | 2.31 | 1.75*** | 2.13 | 2.14 | 1.18 |
| Institutional Ownership | 21.97 | 22.78 | 20.40*** | 21.97 | 21.95 | 22.92 |
| **Firm Characteristics** | | | | | | |
| Free Cash Flow/Assets | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.09*** |
| Sales Growth | 0.14 | 0.15 | 0.12*** | 0.14 | 0.14 | 0.13 |
| Leverage | 0.67 | 0.61 | 0.80*** | 0.67 | 0.68 | 0.36*** |
| **Number of Observations** | 5,599 | 3,689 | 1,910 | 5,585 | 5,480 | 105 |

**Table 2 Treatment Effect Estimations on Total Compensation and its Components.**

This table presents the results of a treatment effect estimation on various pay components (Base Salary, ln(Base Salary), Base Salary/Total Compensation, Bonus, ln(Bonus), Bonus/Total Compensation, Bonus/Base Salary, Incentive Compensation (the sum of stock options and LTIPs), ln (Incentive Compensation), Incentive Compensation/Total Compensation, Total Compensation, ln(Total Compensation), and Total Compensation/Base Salary) for executive directors excluding CEOs (Column (1)) and CEOs (Column (2)). We compare the pay outcome of directors who are similar in age, tenure, position, firm size, industry, and year. The treatment effect is the variable Female. Standard errors are given in brackets; 10%, 5%, or 1% are denoted with *, **, and ***, respectively. The data are from Boardex, Datastream, and Manifest.

| | (1) Executive directors (excl. CEOs) | | (2) CEOs | |
|---|---|---|---|---|
| Dependent variable: | Coefficient | p-value | Coefficient | p-value |
| Base Salary | -19.947*** | 0.000 | -21.168 | 0.246 |
| | (4.530) | | (18.252) | |
| Ln(Base Salary) | -0.164*** | 0.000 | -0.099 | 0.215 |
| | (0.032) | | (0.080) | |
| Base Salary/Total Compensation | 1.016 | 0.372 | 2.938 | 0.334 |
| | (1.150) | | (3.038) | |
| Bonus | -25.604*** | 0.009 | -35.434 | 0.290 |
| | (9.756) | | (33.517) | |
| *Ln(Bonus)* | -.220*** | 0.000 | 0.065 | 0.705 |
| | (0.063) | | (0.172) | |
| Bonus/Total Compensation | -0.028 | 0.970 | -2.551 | 0.149 |
| | (0.722) | | (1.766) | |
| Bonus/Base Salary | -7.022 | 0.359 | -45.566 | 0.133 |
| | (7.662) | | (30.297) | |
| Incentive Compensation | -222.043*** | 0.000 | -32.639 | 0.900 |
| | (51.426) | | (214.756) | |
| Ln(Incentive Compensation) | -0.568*** | 0.000 | 0.139 | 0.775 |
| | (0.162) | | (0.485) | |
| Incentive Compensation/Total Compensation | -0.956 | 0.326 | 0.126 | 0.966 |
| | (0.973) | | (2.968) | |
| Total Compensation | -269.069*** | 0.000 | 116.319 | 0.669 |
| | (53.748) | | (272.314) | |
| Ln(Total Compensation) | -0.134*** | 0.004 | -0.258* | 0.055 |
| | (0.046) | | (0.134) | |
| Total Compensation/Base Salary | -46.998 | 0.886 | -119.679 | 0.971 |
| | (112.969) | | (988.955) | |

**Table 3 The Determinants of Executive Director and CEO Compensation.**

This table presents the results of Tobit regressions on various compensation measures (in log-terms) for executive directors (excl. CEOs) in Panel A and for CEOs in Panel B. LT-Pay is defined as the sum of the Black and Scholes value of stock options and total LTIPs. ST-Pay is defined as the sum of Base Salary and Bonus. Statistical significance at the 10%, 5%, or 1% level is denoted with *, **, and ***, respectively. The data are from Boardex, Datastream, and Manifest.

| **Panel A: Determinants of Executive Dir. Compensation** | (1) Total Pay | (2) Base Salary | (3) Bonus | (4) LT-Pay | (5) ST/LT Pay |
|---|---|---|---|---|---|
| Constant | 4.791*** | 5.065*** | 4.602*** | 3.211*** | 2.277** |
| **Female Presence** | | | | | |
| Female | -0.173*** | -0.123*** | -0.240*** | -0.327*** | 0.251 |
| **Positions** | | | | | |
| Deputy CEO | 0.084*** | -0.134** | -0.021 | 0.199 | -0.163 |
| Finance Director | -0.091*** | -0.218*** | -0.297*** | -0.246*** | 0.079*** |
| Commercial Director | -0.257*** | -0.314*** | -0.457*** | -0.369*** | 0.089 |
| COO | -0.016 | -0.174** | -0.171 | -0.212 | 0.218 |
| Other Executives | -0.183 | -0.215** | -0.192** | -0.098 | -0.162 |
| **Director Characteristics** | | | | | |
| Director Age | -0.011*** | -0.004*** | -0.001 | -0.007*** | 0.008*** |
| Director Tenure | 0.002 | 0.002 | 0.003 | 0.004 | -0.005 |
| **Governance** | | | | | |
| Board Size | 0.027*** | 0.013*** | 0.031*** | 0.048*** | -0.037*** |
| Non-Executive Directors (%) | 0.010*** | 0.005*** | 0.011*** | 0.014*** | -0.007*** |
| Female Directors (%) | 0.002** | 0.001** | 0.003 | 0.006** | -0.004 |
| Audit Committee Presence | -0.521*** | -0.497*** | -0.847*** | 0.488** | -1.099*** |
| Nomination Committee Presence | 0.214*** | 0.148*** | 0.105 | 0.193*** | -0.024 |
| Remuneration Committee Presence | 0.659 | 0.153 | -0.908** | -0.233 | 0.301 |
| Top-3 Remun Consultant Advice | 0.136*** | 0.070*** | 0.124*** | 0.133*** | -0.075 |
| CEO/Chairman Duality | -0.012 | 0.411*** | 0.238*** | -0.899*** | 1.436*** |
| Firm Risk | 0.056*** | 0.047** | 0.024 | 0.118*** | -0.212*** |
| **Performance** | | | | | |
| ROA | 0.008*** | | 0.016*** | 0.006* | -0.003 |
| Tobin's Q | -0.002 | | 0.008 | 0.037*** | -0.049*** |
| **Ownership** | | | | | |
| CEO Ownership | -0.001 | 0.001 | -0.002 | 0.006 | -0.011* |
| Executive Ownership (excl. CEO) | -0.004*** | -0.002* | -0.001 | -0.007*** | 0.006*** |
| Non-Executive Ownership | -0.012*** | -0.009*** | -0.009*** | -0.011*** | 0.001 |
| Corporate Ownership | -0.002*** | -0.002*** | 0 | -0.004*** | 0.002 |
| Pension Fund Ownership | 0.001 | 0.001 | -0.033*** | 0.012 | -0.024** |
| Individual & Families Ownership | -0.005*** | -0.003*** | 0.001 | -0.012*** | 0.012*** |
| Institutional Ownership | -0.001 | -0.001*** | 0.001 | -0.002*** | 0.002* |
| **Firm Characteristics** | | | | | |
| Free Cash Flow/Assets | -0.256* | 0.304*** | -0.465*** | -1.167*** | 1.604*** |
| Sales Growth | 0.042*** | -0.005 | 0.171*** | 0.024 | 0.228* |
| Leverage | 0.065*** | 0.046*** | 0.024* | -0.006 | 0.027 |
| FTSE100 | 1.022*** | 0.666*** | 1.068*** | 1.023*** | -0.422*** |
| FTSE250 | 0.486*** | 0.320*** | 0.489*** | 0.485*** | -0.220*** |
| FTSE Small Cap | 0.088*** | 0.051*** | 0.02 | 0.012 | -0.004 |
| Year Dummies | Yes | Yes | Yes | Yes | Yes |
| Industry Dummies | Yes | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.186 | 0.194 | 0.165 | 0.137 | 0.052 |
| Number of Observations | 15381 | 15244 | 10225 | 7448 | 7405 |

**Table 3 (Continued).**

| **Panel B: Determinants of CEO Compensation.** | (1) Total Pay | (2) Base Salary | (3) Bonus | (4) LT-Pay | (5) ST/LT Pay |
|---|---|---|---|---|---|
| Constant | 2.871*** | 4.144*** | 5.025*** | 2.432*** | 1.315** |
| **Female Presence** | | | | | |
| Female | -0.084*** | -0.082*** | -0.03 | 0.003 | -0.085 |
| **Director Characteristics** | | | | | |
| CEO Age | -0.002 | 0.006*** | 0.002 | -0.005*** | 0.017*** |
| CEO Tenure | -0.001 | 0.002 | 0.003 | -0.007*** | 0.017*** |
| **Governance** | | | | | |
| Board Size | 0.050*** | 0.034*** | 0.052*** | 0.054*** | -0.018*** |
| Non-Executive Directors (%) | 0.010*** | 0.004*** | 0.010*** | 0.013*** | -0.008*** |
| Female Directors (%) | 0.003*** | 0.004*** | 0.002*** | 0.006*** | -0.002 |
| Audit Committee Presence | 0.003 | 0.085 | -0.935*** | 1.324*** | -0.650*** |
| Nomination Committee Presence | 0.217*** | 0.144*** | 0.055 | 0.228*** | -0.261*** |
| Remuneration Committee Presence | 1.656 | -0.320*** | -1.319*** | -0.560*** | 0.088 |
| Top-3 Remun Consultant Advice | 0.148*** | 0.075*** | 0.112*** | 0.112*** | -0.037 |
| CEO/Chairman Duality | 0.033* | 0.037*** | 0.240*** | 0.290*** | -0.550*** |
| Firm Risk | 0.093*** | 0.038** | 0.089*** | 0.004 | 0.048*** |
| **Performance** | | | | | |
| ROA | 0.010*** | | 0.018*** | 0.005*** | 0.001 |
| Tobin's Q | 0.000 | | 0.007 | 0.035*** | -0.033*** |
| **Ownership** | | | | | |
| CEO Ownership | -0.006** | -0.002* | -0.005 | -0.005** | 0.004 |
| Executive Ownership (excl. CEO) | -0.006*** | -0.004*** | -0.008*** | -0.005*** | -0.005 |
| Non-Executive Ownership | -0.007*** | -0.004*** | -0.006*** | -0.008 | 0.002 |
| Corporate Ownership | 0 | 0 | 0 | -0.002*** | 0.004*** |
| Pension Fund Ownership | -0.009 | -0.004 | -0.022 | -0.010* | -0.007 |
| Individual & Families Ownership | -0.006*** | -0.003*** | 0 | -0.005*** | 0.004* |
| Institutional Ownership | 0.001 | 0 | 0.001*** | -0.001 | 0.002** |
| **Firm Characteristics** | | | | | |
| Free Cash Flow/Assets | -0.239** | 0.199*** | -0.262** | -0.302** | 0.197 |
| Sales Growth | -0.02 | -0.082*** | 0.184*** | 0.085** | -0.115 |
| Leverage | 0.075*** | 0.065*** | 0.004 | 0.026*** | -0.030** |
| FTSE100 | 1.190*** | 0.693*** | 1.242*** | 1.188*** | -0.585*** |
| FTSE250 | 0.551*** | 0.346*** | 0.569*** | 0.542*** | -0.220*** |
| FTSE Small Cap | 0.117*** | 0.050** | 0.157*** | -0.051*** | 0.194*** |
| Year Dummies | Yes | Yes | Yes | Yes | Yes |
| Industry Dummies | Yes | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.296 | 0.521 | 0.192 | 0.137 | 0.041 |
| Number of Observations | 4529 | 4496 | 3321 | 2522 | 2503 |

**Table 4 Performance Sensitivity of Executive Director and CEO Compensation.**

This table presents the results of Tobit regressions on the components of pay (in log-terms) for executive directors (excl. CEOs) in Panel A, and for CEOs in Panel B. LT-Pay is the sum of the Black and Scholes value of stock options and total LTIPs. ST-Pay is the sum of Base Salary and Bonus. Statistical significance at the 10%, 5%, or 1% level is denoted with *, **, and ***, respectively. The data are from Boardex, Datastream, and Manifest.

| **Panel A Executive Director Compensation.** | (1) Total Pay | (2) Base Salary | (3) Bonus | (4) LT-Pay | (5) ST/LT Pay |
|---|---|---|---|---|---|
| Constant | 4.784*** | 11.839*** | 4.591*** | 3.210*** | 2.277** |
| **Female Presence** | | | | | |
| Female | -0.126*** | -0.122*** | -0.199* | -0.336*** | 0.257 |
| Female * ROA | -0.002 | | -0.001 | 0.004 | -0.002 |
| Female * Tobin's Q | -0.014 | | -0.012 | 0.001 | -0.001 |
| **Positions** | | | | | |
| Deputy CEO | 0.085*** | -0.137** | -0.021 | 0.199 | -0.163 |
| Finance Director | -0.091*** | -0.219*** | -0.296*** | -0.246*** | 0.079*** |
| Commercial Director | -0.255*** | -0.314*** | -0.455*** | -0.368*** | 0.088 |
| COO | -0.016 | -0.174** | -0.171 | -0.212 | 0.218 |
| Other Executives | -0.183 | -0.215** | -0.192** | -0.098 | -0.162 |
| **Director Characteristics** | | | | | |
| Director Age | -0.011*** | -0.004*** | -0.001 | -0.007*** | 0.008*** |
| Director Tenure | 0.002 | 0.002 | 0.003 | 0.004 | -0.005 |
| **Governance** | | | | | |
| Board Size | 0.027*** | 0.013*** | 0.031*** | 0.048*** | -0.037*** |
| Non-Executive Directors (%) | 0.010*** | 0.005*** | 0.011*** | 0.014*** | -0.007*** |
| Female Directors (%) | 0.002** | 0.001** | 0.003 | 0.006*** | -0.004 |
| Audit Committee Presence | -0.522*** | -0.497*** | -0.849*** | 0.487** | -1.098*** |
| Nomination Committee Presence | 0.214*** | 0.148*** | 0.105 | 0.194*** | -0.024 |
| Remuneration Committee Presence | 0.664 | 0.153 | -0.899** | -0.232 | 0.301 |
| Top-3 Remun Consultant Advice | 0.136*** | 0.070*** | 0.124*** | 0.133*** | -0.075 |
| CEO/Chairman Duality | -0.013 | 0.413*** | 0.237*** | -0.900*** | 1.436*** |
| Firm Risk | 0.056*** | 0.046** | 0.025 | 0.118** | -0.212*** |
| **Performance** | | | | | |
| ROA | 0.008*** | | 0.016*** | 0.006 | -0.003 |
| Tobin's Q | -0.001 | | 0.008 | 0.037*** | -0.049*** |
| **Ownership** | | | | | |
| CEO Ownership | -0.001 | 0.001 | -0.002 | 0.006 | -0.011* |
| Executive Ownership (excl. CEO) | -0.004*** | -0.002* | -0.001 | -0.007*** | 0.006*** |
| Non-Executive Ownership | -0.012*** | -0.009*** | -0.009*** | -0.011*** | 0.001 |
| Corporate Ownership | -0.002*** | -0.002*** | 0 | -0.004*** | 0.002 |
| Pension Fund Ownership | 0.001 | 0.001 | -0.033*** | 0.012 | -0.024** |
| Individual & Families Ownership | -0.005*** | -0.003*** | 0.001 | -0.012*** | 0.012*** |
| Institutional Ownership | -0.001 | -0.001*** | 0.001 | -0.002*** | 0.002* |
| **Firm Characteristics** | | | | | |
| Free Cash Flow/Assets | -0.255* | 0.305*** | -0.464*** | -1.166*** | 1.603*** |
| Sales Growth | 0.042*** | -0.006 | 0.171*** | 0.025 | 0.228* |
| Leverage | 0.065*** | 0.046*** | 0.024* | -0.006 | 0.027 |
| FTSE100 | 1.021*** | 0.666*** | 1.068*** | 1.023*** | -0.423*** |
| FTSE250 | 0.486*** | 0.320*** | 0.489*** | 0.485*** | -0.220*** |
| FTSE Small Cap | 0.088*** | 0.050*** | 0.02 | 0.012 | -0.004 |
| Year and Industry Dummies | Yes | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.186 | 0.197 | 0.165 | 0.137 | 0.052 |
| Number of Observations | 15381 | 15244 | 10225 | 7448 | 7405 |

**Table 4 (continued).**

| **Panel B: Performance Sensitivity of CEO Compensation.** | (1) Total Pay | (2) Base Salary | (3) Bonus | (4) LT-Pay | (5) ST/LT Pay |
|---|---|---|---|---|---|
| Constant | 2.876*** | 10.913*** | 5.041*** | 2.450*** | 0.83 |
| **Female Presence** | | | | | |
| Female | -0.157*** | -0.082*** | -0.291*** | -0.168** | 0.022 |
| Female * ROA | 0.011*** | | 0.018*** | 0.002** | 0.025*** |
| Female * Tobin's Q | 0.005** | | 0.036*** | 0.041*** | -0.077*** |
| **Director Characteristics** | | | | | |
| CEO Age | -0.002 | 0.006*** | 0.002 | -0.005*** | 0.018*** |
| CEO Tenure | -0.001 | 0.002 | 0.003 | -0.007*** | 0.016*** |
| **Governance** | | | | | |
| Board Size | 0.050*** | 0.034*** | 0.051*** | 0.054*** | -0.018*** |
| Non-Executive Directors (%) | 0.010*** | 0.004*** | 0.010*** | 0.013*** | -0.008*** |
| Female Directors (%) | 0.003*** | 0.004*** | 0.002*** | 0.006*** | -0.002 |
| Audit Committee Presence | 0.004 | 0.085 | -0.930*** | 1.317*** | -0.650*** |
| Nomination Committee Presence | 0.218*** | 0.144*** | 0.058 | 0.233*** | -0.268*** |
| Remuneration Committee Presence | 1.653 | -0.320*** | -1.321*** | -0.561*** | 0.085 |
| Top-3 Remun Consultant Advice | 0.148*** | 0.075*** | 0.112*** | 0.112*** | -0.037 |
| CEO/Chairman Duality | 0.033** | 0.037*** | 0.241*** | 0.291*** | -0.552*** |
| Firm Risk | 0.092*** | 0.038** | 0.089*** | 0.002 | 0.048*** |
| **Performance** | | | | | |
| ROA | 0.010*** | | 0.018*** | 0.005*** | 0.001 |
| Tobin's Q | -0.001 | | 0.005 | 0.034*** | -0.032*** |
| **Ownership** | | | | | |
| CEO Ownership | -0.006** | -0.002* | -0.005 | -0.005** | 0.004 |
| Executive Ownership (excl. CEO) | -0.006*** | -0.004*** | -0.008*** | -0.005*** | -0.005 |
| Non-Executive Ownership | -0.007*** | -0.004*** | -0.006*** | -0.008 | 0.002 |
| Corporate Ownership | 0 | 0 | 0 | -0.002*** | 0.004*** |
| Pension Fund Ownership | -0.009 | -0.004 | -0.022 | -0.010* | -0.007 |
| Individual & Families Ownership | -0.006*** | -0.003*** | 0 | -0.005*** | 0.004* |
| Institutional Ownership | 0.001 | 0 | 0.001*** | -0.001 | 0.002** |
| **Firm Characteristics** | | | | | |
| Free Cash Flow/Assets | -0.237** | 0.199*** | -0.262** | -0.309** | 0.205 |
| Sales Growth | -0.02 | -0.082*** | 0.184*** | 0.084** | -0.119 |
| Leverage | 0.076*** | 0.065*** | 0.005 | 0.027*** | -0.030** |
| FTSE100 | 1.191*** | 0.693*** | 1.244*** | 1.189*** | -0.586*** |
| FTSE250 | 0.551*** | 0.346*** | 0.566*** | 0.540*** | -0.220*** |
| FTSE Small Cap | 0.117*** | 0.050** | 0.155*** | -0.053*** | 0.196*** |
| Year and Industry Dummies | Yes | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.296 | 0.525 | 0.192 | 0.137 | 0.042 |
| Number of Observations | 4529 | 4496 | 3321 | 2522 | 2503 |

**Table 5 The Effect of Female Non-Executive Directors on the Board.**

This table presents the results of a Tobit regression of ln(total compensation) for executives (excl. CEOs) and CEOs, conditional on the presence of one or more female non-executive directors on the board at (t-1). Model (1) is the standard Tobit and Model (2) includes interactions between Female and the performance variables (ROA, Tobin's Q). The excluded benchmark position is that of Executive Chairman. Statistical significance at the 10%, 5%, or 1% level is denoted with *, **, and ***, respectively. The data are from Boardex, Datastream, and Manifest.

| | Executives (excl. CEOs) | | CEOs | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | 5.211*** | 5.061*** | 5.148*** | 5.162*** |
| **Female Presence** | | | | |
| Female | -0.109** | -0.097 | 0.202*** | 0.019*** |
| Female * ROA | | 0.011 | | 0.018*** |
| Female * Tobin's Q | | -0.02 | | 0.020*** |
| **Positions** | | | | |
| Deputy CEO | 0.249*** | 0.251*** | | |
| Finance Director | -0.026 | -0.027 | | |
| Commercial Director | -0.223** | -0.199** | | |
| COO | 0.05 | 0.053 | | |
| Other Executives | -0.037 | -0.037 | | |
| **Director Characteristics** | | | | |
| Director/CEO Age | -0.016*** | -0.016*** | -0.004*** | -0.004*** |
| Director/CEO Tenure | 0.001 | 0.001 | -0.002 | -0.002 |
| **Governance** | | | | |
| Board Size | 0.020*** | 0.020*** | 0.048*** | 0.048*** |
| Non-Executive Directors (%) | 0.010*** | 0.010*** | 0.009*** | 0.009*** |
| Female Directors (%) | -0.002 | -0.002 | 0.001 | 0.001 |
| Audit Committee Presence | | | | |
| Nomination Committee Presence | 0.356*** | 0.353*** | 0.272*** | 0.276*** |
| Remuneration Committee Presence | -0.011 | -0.01 | -0.196*** | -0.196*** |
| Top-3 Remun Consultant Advice | 0.110*** | 0.112*** | 0.119*** | 0.115*** |
| CEO/Chairman Duality | | | 0.027 | 0.025 |
| Firm Risk | 0.031 | 0.032 | 0.000 | -0.007 |
| **Performance** | | | | |
| ROA | 0.010*** | 0.009*** | 0.012*** | 0.012*** |
| Tobin's Q | 0.008 | 0.008* | -0.002 | -0.004 |
| **Ownership** | | | | |
| CEO Ownership | -0.002 | -0.003 | -0.014 | -0.015 |
| Executive Ownership (excl. CEO) | -0.001 | -0.001 | -0.008*** | -0.008*** |
| Non-Executive Ownership | -0.016*** | -0.016*** | -0.013*** | -0.013*** |
| Corporate Ownership | -0.003*** | -0.003*** | -0.002*** | -0.003*** |
| Pension Fund Ownership | -0.016** | -0.015** | -0.024 | -0.027 |
| Individual & Families Ownership | -0.006* | -0.004* | -0.007*** | -0.009*** |
| Institutional Ownership | -0.001 | -0.001 | 0.001 | 0.001* |
| **Firm Characteristics** | | | | |
| Free Cash Flow/Assets | -0.408 | -0.415 | -0.273** | -0.328*** |
| Sales Growth | 0.166*** | 0.166*** | 0.109** | 0.095** |
| Leverage | 0.065*** | 0.064*** | 0.077*** | 0.078*** |
| FTSE100 | 0.889*** | 0.888*** | 1.131*** | 1.133*** |
| FTSE250 | 0.267*** | 0.267*** | 0.338*** | 0.337*** |
| FTSE Small Cap | -0.027 | -0.026 | -0.046*** | -0.048*** |
| Year Dummies | Yes | Yes | Yes | Yes |
| Industry Dummies | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.183 | 0.183 | 0.346 | 0.347 |
| Number of Observations | 3986 | 3986 | 1061 | 1061 |

**Table 6 Industrial Segregation and the Gender Pay Gap.**

This table presents the results of a Tobit regression on ln(total compensation) for both the executives (excl. CEOs) and the CEOs, including interaction terms between the variable Female and the Performance variables (ROA, Tobin's Q). The analysis is restricted to those industries with the largest employment of male executives. The significance of the results at the 10%, 5%, or 1% level is denoted with *, **, and ***, respectively.

| | Executives (excl. CEOs) | | CEOs | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | 4.644*** | 4.646*** | 4.498*** | 4.896*** |
| **Female Presence** | | | | |
| Female | -0.067*** | -0.016 | 0.074* | 0.032 |
| Female * ROA | | -0.006 | | 0.000 |
| Female * Tobin's Q | | -0.011 | | 0.011 |
| **Positions** | | | | |
| Deputy CEO | 0.141*** | 0.142*** | | |
| Finance Director | -0.082* | -0.081* | | |
| Commercial Director | -0.300*** | -0.298*** | | |
| COO | 0.005 | 0.005 | | |
| Other Executives | -0.096 | -0.096 | | |
| **Director Characteristics** | | | | |
| Director/CEO Age | -0.011*** | -0.011*** | -0.002*** | -0.003*** |
| Director/CEO Tenure | 0.005* | 0.005* | 0.002 | 0.002 |
| **Governance** | | | | |
| Board Size | 0.024*** | 0.024*** | 0.041*** | 0.041*** |
| Non-Executive Directors (%) | 0.009*** | 0.009*** | 0.009*** | 0.009*** |
| Female Directors (%) | 0.001 | 0.001 | 0.004*** | 0.004*** |
| Audit Committee Presence | -0.521*** | -0.522*** | 0.111*** | 0.110*** |
| Nomination Committee Presence | 0.200*** | 0.201*** | 0.214*** | 0.216*** |
| Remuneration Committee Presence | -0.747*** | -0.746*** | -0.708*** | -0.708*** |
| Top-3 Remun Consultant Advice | 0.100*** | 0.100*** | 0.148*** | 0.148*** |
| CEO/Chairman Duality | -0.054* | -0.055* | 0.06 | 0.061 |
| Firm Risk | 0.047** | 0.048** | 0.047*** | 0.047*** |
| **Performance** | | | | |
| ROA | 0.009*** | 0.009*** | 0.011*** | 0.011*** |
| Tobin's Q | 0.004 | 0.004 | 0.002 | 0.002 |
| **Ownership** | | | | |
| CEO Ownership | -0.003* | -0.003* | -0.009*** | -0.009*** |
| Executive Ownership (excl. CEO) | -0.002*** | -0.002*** | -0.001 | -0.001 |
| Non-Executive Ownership | -0.010*** | -0.010*** | -0.007*** | -0.007*** |
| Corporate Ownership | -0.001* | -0.001* | 0.001 | 0.001 |
| Pension Fund Ownership | -0.011*** | -0.011*** | -0.030*** | -0.030*** |
| Individual & Families Ownership | -0.003* | -0.003* | -0.005*** | -0.005*** |
| Institutional Ownership | 0.000 | 0.000 | 0.002*** | 0.002*** |
| **Firm Characteristics** | | | | |
| Free Cash Flow/Assets | -0.071 | -0.072 | -0.203 | -0.207 |
| Sales Growth | 0.074* | 0.075* | 0.016 | 0.016 |
| Leverage | 0.055*** | 0.055*** | 0.055*** | 0.056*** |
| FTSE100 | 0.970*** | 0.969*** | 1.133*** | 1.134*** |
| FTSE250 | 0.512*** | 0.512*** | 0.588*** | 0.588*** |
| FTSE Small Cap | 0.083* | 0.082* | 0.099*** | 0.099*** |
| Year Dummies | Yes | Yes | Yes | Yes |
| Industry Dummies | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.199 | 0.199 | 0.315 | 0.315 |
| Number of Observations | 8158 | 8158 | 2367 | 2367 |

**Table 7 The Effect of Remuneration Consultants on the Gender Pay Gap.**

This table presents the results of a Tobit regression on ln(total compensation) for both executive directors (excl. CEOs) and CEOs, conditional on the presence of a top-3 remuneration consultant. Model (1) is the standard Tobit; Model (2) also includes interactions between the variable female and the performance variables. The significance of the results at the 10%, 5%, or 1% level is denoted with *, **, and ***, respectively.

| | Executives (excl. CEOs) | | CEOs | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Constant | 4.779*** | 4.772*** | 2.840*** | 2.849*** |
| **Female Presence** | | | | |
| Female | -0.118*** | -0.075 | -0.278*** | -0.426*** |
| Female * ROA | | -0.002 | | 0.007*** |
| Female * Tobin's Q | | -0.014 | | 0.029*** |
| Female * Top-3 Remun Consultant | -0.119** | -0.116** | 0.516*** | 0.539*** |
| **Positions** | | | | |
| Deputy CEO | 0.084*** | 0.084*** | | |
| Finance Director | -0.092*** | -0.091*** | | |
| Commercial Director | -0.254*** | -0.253*** | | |
| COO | -0.016 | -0.016 | | |
| Other Executives | -0.183 | -0.183 | | |
| **Director Characteristics** | | | | |
| Director/CEO Age | -0.011*** | -0.011*** | -0.002 | -0.002 |
| Director/CEO Tenure | 0.002 | 0.002 | -0.001 | -0.001 |
| **Governance** | | | | |
| Board Size | 0.027*** | 0.027*** | 0.050*** | 0.050*** |
| Non-Executive Directors (%) | 0.010*** | 0.010*** | 0.010*** | 0.010*** |
| Female Directors (%) | 0.002** | 0.002** | 0.003*** | 0.003*** |
| Audit Committee Presence | -0.523*** | -0.524*** | 0.011 | 0.012 |
| Nomination Committee Presence | 0.213*** | 0.214*** | 0.212*** | 0.214*** |
| Remuneration Committee Presence | 0.673 | 0.677 | 1.659 | 1.657 |
| Top-3 Remun Consultant Advice | 0.141*** | 0.141*** | 0.139*** | 0.139*** |
| CEO/Chairman Duality | -0.011 | -0.012 | 0.029* | 0.030* |
| Firm Risk | 0.056*** | 0.056*** | 0.093*** | 0.092*** |
| **Performance** | | | | |
| ROA | 0.008*** | 0.008*** | 0.010*** | 0.010*** |
| Tobin's Q | -0.002 | -0.001 | 0.000 | -0.001 |
| **Ownership** | | | | |
| CEO Ownership | -0.001 | -0.001 | -0.006** | -0.006** |
| Executive Ownership (excl. CEO) | -0.004*** | -0.004*** | -0.006*** | -0.006*** |
| Non-Executive Ownership | -0.012*** | -0.012*** | -0.007*** | -0.007*** |
| Corporate Ownership | -0.002*** | -0.002*** | 0.000 | 0.000 |
| Pension Fund Ownership | 0.001 | 0.001 | -0.009 | -0.009 |
| Individual & Families Ownership | -0.005*** | -0.005*** | -0.006*** | -0.006*** |
| Institutional Ownership | -0.001 | -0.001 | 0.001 | 0.001 |
| **Firm Characteristics** | | | | |
| Free Cash Flow/Assets | -0.257* | -0.256* | -0.225* | -0.227* |
| Sales Growth | 0.042*** | 0.042*** | -0.018 | -0.018 |
| Leverage | 0.065*** | 0.065*** | 0.077*** | 0.078*** |
| FTSE100 | 1.022*** | 1.021*** | 1.187*** | 1.188*** |
| FTSE250 | 0.486*** | 0.486*** | 0.552*** | 0.552*** |
| FTSE Small Cap | 0.089*** | 0.089*** | 0.118*** | 0.117*** |
| Year Dummies | Yes | Yes | Yes | Yes |
| Industry Dummies | Yes | Yes | Yes | Yes |
| Pseudo R-Squared | 0.186 | 0.186 | 0.297 | 0.297 |
| Number of Observations | 15381 | 15381 | 4529 | 4529 |

**Table 8 Marital Status and Number of Children.**

Panel A presents the frequency of children for all directors (incl. CEOs) for both the original data set and after applying multiple imputation ('Imputed data'), based on director-year observations. Panel B shows the frequency of family status (Single, Married) based on firm-year observations. The Imputed variables are Number (#) of Children and Married. The data are from Manifest, Who's Who UK, Marquis Who's Who, and from our own survey.

**Panel A: Children.**

| # of Children | Original data | | Imputed data | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| 0 | - | 1 | 9 | 235 |
| | *(0.0%)* | *(0.6%)* | *(0.2%)* | *(17.1%)* |
| 1 | 34 | 25 | 718 | 892 |
| | *(4.6%)* | *(15.4%)* | *(15.9%)* | *(65.0%)* |
| 2 | 350 | 96 | 2,963 | 205 |
| | *(47.7%)* | *(59.3%)* | *(65.8%)* | *(14.9%)* |
| 3 | 256 | 37 | 714 | 37 |
| | *(34.9%)* | *(22.8%)* | *(15.9%)* | *(2.7%)* |
| 4 | 62 | 3 | 69 | 3 |
| | *(8.5%)* | *(1.9%)* | *(1.5%)* | *(0.2%)* |
| 5 | 26 | - | 26 | - |
| | *(3.5%)* | *(0.0%)* | *(0.6%)* | *(0.0%)* |
| 6 | 5 | - | 5 | - |
| | *(0.7%)* | *(0.0%)* | *(0.1%)* | *(0.0%)* |
| Total | 733 | 162 | 4,504 | 1,372 |
| | *(100.0%)* | *(100.0%)* | *(100.0%)* | *(100.0%)* |

**Panel B: Marital Status**

| Marital status | Original data | | Imputed data | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Single | 65 | 90 | 650 | 642 |
| | *(39.2%)* | *(38.8%)* | *(12.2%)* | *(37.9%)* |
| Married | 101 | 142 | 4,680 | 1054 |
| | *(60.8%)* | *(61.2%)* | *(87.8%)* | *(62.1%)* |
| Total | 166 | 232 | 5,330 | 1,696 |
| | *(100.0%)* | *(100.0%)* | *(100.0%)* | *(100.0%)* |

**Table 9 Remuneration, Children, and Marital Status.**

Panel A presents the average of the remuneration components (Base Salary, Bonus, Incentive Compensation, Total Compensation) and their frequencies for all (male and female) executive directors, depending on parenthood a director has a child or does not have a child. Panel B presents similar data but partitions the executive directors based on marital status. Columns (1)-(3) and (4)-(6) give the average pay component by type of executive director, and columns (5)-(7) also report the statistical significance of the difference between columns (1)-(3) and (5)-(7) respectively (whereby the 10%, 5%, and 1% level are denoted with *, **, and ***). The pay gaps (columns (4) and (8)) are the differences in pay between female and male executives (respectively column (2) minus column (3) and column (6) minus column (7)). The data are from BoardEx, Manifest, Who's Who UK, Marquis Who's Who, and from our own survey, but the data on children and marital status are imputed.

**Panel A: Average Compensation by Number of Children.**

| | Nr. of Children = 0 | | | Pay Gap 1 | Nr. of Children > 0 | | | Pay Gap 2 |
|---|---|---|---|---|---|---|---|---|
| Compensation Components (in £ 000) | (1) Total | (2) Male | (3) Female | (4) (Male-Female) | (5) Total | (6) Male | (7) Female | (8) (Male-Female) |
| Base Salary | 166.93 | 197.48 | 154.99 | 42.49*** | 207.74*** | 217.32** | 170.28*** | 47.04*** |
| Bonus | 80.73 | 109.83 | 69.36 | 40.47*** | 129.37*** | 140.65 | 85.29*** | 55.35*** |
| Incentive Compensation | 194.12 | 409.07 | 110.09 | 298.98*** | 334.38*** | 373.58 | 181.16*** | 192.42*** |
| Total Compensation | 473.42 | 748.31 | 365.96 | 382.35*** | 715.56*** | 774.97 | 483.33*** | 291.64*** |
| *Frequency in %* | *5.9%* | *2.1%* | *18.0%* | | *94.1%* | *97.9%* | *82.0%* | |

**Panel B: Average Compensation by Marital Status.**

| | Single | | | Pay Gap 3 | Married | | | Pay Gap 4 |
|---|---|---|---|---|---|---|---|---|
| Compensation Components (in £ 000) | Total | Male | Female | (Male-Female) | Total | Male | Female | (Male-Female) |
| Base Salary | 188.66 | 204.95 | 157.34 | 47.61*** | 211.85*** | 220.68*** | 174.62*** | 46.07*** |
| Bonus | 105.10 | 123.44 | 69.84 | 53.60*** | 134.87*** | 145.23*** | 91.18*** | 54.05*** |
| Incentive Compensation | 306.90 | 395.31 | 136.89 | 258.42*** | 333.68 | 367.69 | 190.27*** | 177.43*** |
| Total Compensation | 642.92 | 771.42 | 395.79 | 375.64*** | 724.16*** | 775.34 | 508.39*** | 266.95*** |
| *Frequency in %* | *28.1%* | *24.1%* | *41.0%* | | *71.9%* | *75.9%* | *59.0%* | |

**Table 10 Treatment Effect Estimation (Female Manager) on Components of Pay for Executive Directors (excl. CEOs).**

This table presents the results of a treatment effect estimation - the treatment is Female - on various pay components (Base Salary, Bonus, Equity-based Compensation, Total Compensation) for executive directors excl. CEOs. We compare the pay outcome of directors similar in terms of age, tenure, position, firm size, industry, and year in Model (1). In addition, we account for parenthood - the presence of children when the dummy equals 1 ((Model (2)), and for marital status – the dummy is 1 in case the director is married (Model (3)). Standard errors are in brackets; 10%, 5%, or 1% are denoted with *, **, and ***, respectively. The data are from Manifest, Who's Who UK, Marquis Who's Who, and from our own survey, but the data on children and marital status are imputed.

| | **(1)** | | **(2)** | | **(3)** | |
|---|---|---|---|---|---|---|
| | **Female** | | **Children** | | **Married** | |
| Dependent variable: | Coef. | p-value | Coef. | p-value | Coef. | p-value |
| Base Salary | -21.454*** | 0.000 | -39.394*** | 0.000 | -27.902*** | 0.000 |
| | (4.026) | | (4.553) | | (4.063) | |
| Bonus | -40.394*** | 0.009 | -36.253*** | 0.000 | -33.251** | 0.017 |
| | (15.444) | | (7.115) | | (13.869) | |
| Equity-based Compensation | -98.461*** | 0.007 | -186.000*** | 0.000 | -132.070*** | 0.001 |
| | (36.728) | | (41.009) | | (41.513) | |
| Total Compensation | -161.011*** | 0.000 | -267.059*** | 0.000 | -195.182*** | 0.000 |
| | (45.553) | | (45.358) | | (49.086) | |

## Appendix A: Variable Description and Data Source

**Panel A: Female Presence**

| | |
|---|---|
| Female | A binary variable capturing the gender of the executive director/CEO. Female is 1; male is zero. *Source: Boardex, Manifest* |

**Panel B: Positions**

| | |
|---|---|
| (Deputy) CEO | A dummy variable equal to one if a director holds the position of (Deputy) CEO. Source: *Boardex, Manifest.* |
| Executive Chairman | A dummy variable equal to one if a director holds the position of Executive Chairman. Source: *Boardex, Manifest.* |
| Finance Director | A dummy variable equal to one if a director holds the position of Finance Director. Source: *Boardex, Manifest.* |
| Commercial Director | A dummy variable equal to one if a director holds the position of Commercial Director. Source: *Boardex, Manifest.* |
| COO | A dummy variable equal to one if a director holds the position of Chief Operating Officer. Source: *Boardex, Manifest.* |
| Other Executives | A dummy variable equal to one if the executive director does not hold one of the above positions. Source: *Boardex, Manifest.* |

**Panel C: Remuneration**

| | |
|---|---|
| Total Compensation | Sum of all components of remuneration (see below). Source: Own calculations based on *Boardex, Manifest* |
| Base Salary | Fixed remuneration. Source: *Boardex, Manifest* |
| Bonus | Remuneration based on last-year's performance; paid out annually. Source: *Boardex, Manifest* |
| LT-Pay | Remuneration comprising of stock options and restricted shares (LTIPs). Source: Own calculations, *Boardex, Manifest* |
| ST/LT-Pay | Remuneration calculated as sum of Base Salary and Bonus (short-term pay) divided by Long-Term Pay (LT). Source: *Boardex, Manifest* |

**Panel D: Director Characteristics**

| | |
|---|---|
| Director Age (CEO Age) | The age of a director (CEO) (in number of years). Source: *Boardex, Manifest* |
| Director Tenure (CEO Tenure) | The number of years a director (CEO) serves in the current position (on the board). Source: *Boardex, Manifest* |

**Panel E: Governance**

| | |
|---|---|
| Board Size | The number of directors on the board. Source: *Boardex*, *Manifest* |
| Non-executive directors (%) | The percentage of non-executive directors serving on the board. Source: *Boardex*, *Manifest* |
| Female (%) | Percentage of female directors on the board. Source: *Boardex, Manifest.* |
| Audit Comm. Presence | A dummy variable equal to one if an audit committee is present. Source: *Boardex*, *Manifest* |
| Nomination Comm. Presence | A dummy variable equal to one if a nomination committee is present. Source: *Boardex, Manifest* |
| Remuneration Comm. Presence | A dummy variable equal to one if a remuneration committee is present. Source: *Boardex*, *Manifest* |
| Firm Risk | The (winsorized) variance of cash flow per shares. Source: *Datastream* |
| Top-3 Remuneration Consultant | A dummy variable equal to one if a remuneration consultant (belonging to the top-3 remuneration consultants based on overall client count of the sample) has advised the company. Source: *Boardex, Manifest.* |
| CEO/Chairman Duality | A dummy variable equal to one if the chairman of the board also serves as CEO. Source: *Boardex*, *Manifest.* |

**Panel F: Performance**

| | |
|---|---|
| ROA (in %) | Return on Assets. Source: *Datastream* |
| Tobin's Q | Market capitalization divided by the book value of equity. Source: *Datastream* |

**Panel G: Ownership**

| | |
|---|---|
| CEO Ownership | The percentage of stock held by the CEO. Source: *Boardex, Manifest* |
| Executive Ownership (excl. CEOs) | The percentage of stock held by the executive directors (excl. CEOs). Source: *Boardex, Manifest* |
| Non-Executive Ownership | The percentage of stock held by the non-executive directors. Source: *Boardex, Manifest* |
| Corporate Ownership | The percentage of stock held by corporations. Source: *Boardex, Manifest* |
| Institutional Ownership | The percentage of stock held by financial institutions (banks, building societies, insurance and assurance financials, unit trusts, investment banks and investment trusts, venture capital and private equity firms). Source: *Boardex, Manifest* |
| Pension Fund Ownership | The percentage of stock held by pension funds. Source: *Boardex, Manifest* |
| Individuals & Families Ownership | The percentage of stock held by individuals and families. Source: *Boardex, Manifest* |

**Panel H: Firm Characteristics**

| | |
|---|---|
| Free Cash Flow / Assets | Free cash flow divided by assets. Source: *Boardex, Manifest* |
| Sales Growth | The difference in total sales from the actual and the previous year divided by lagged net sales (winsorized). Source: *Boardex, Manifest* |
| Leverage | Debt divided by equity (winsorized). Source: *Datastream.* |
| FTSE 100 | A dummy variable equal to one if a company is member of the FTSE100. Source: *Boardex, Manifest* |
| FTSE 250 | A dummy variable equal to one if a company is member of the FTSE250. Source: *Boardex, Manifest* |
| FTSE Small Cap | A dummy variable equal to one if a company is member of the FTSE Small Cap. Source: *Boardex, Manifest* |

**Panel I: Private Characteristics**

| | |
|---|---|
| Number of children | A dummy variable equal to one if a director has one (or more) child(ren). Source: *Who's Who UK, Marquis Who's Who, Own survey.* |
| Marital Status | Single if individual is not currently married, married otherwise. Source: *Who's Who UK, Marquis Who's Who, Own survey.* |